

### **First principles prediction of the solar cell efficiency of chalcopyrite materials $\text{AgMX}_2$ (M=In, Al; X=S, Se, Te)**

Using the spectroscopic limited maximum efficiency, and Shockley and Queisser predictor models, we compute the solar efficiency of the chalcopyrites  $\text{AgMX}_2$  (M = In, Al; X = S, Se, Te). The results presented are based on the estimation of the electronic and optical properties obtained from first principles density functional theory as well as the many-body perturbation theory calculations. The results from this report were consistent with the experimental data. The optical bandgap was accurately estimated from the absorption spectra, obtained by solving the Bethe and Salpeter equation. Fitting the Tauc's plot on the absorption spectra, we also predicted that the materials studied have a direct allowed optical transition. The theoretical estimations of the solar cell performance showed that the efficiencies from the Shockley and Queisser model are higher than those from the spectroscopic limited maximum efficiency model. This improvement is attributed to the absorption, the recombination processes and the optical transition accounted in the calculation of the efficiency.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Electrical Engineering, University of South Africa, University of Witwatersrand

Contributors: Dongho-Nguimdo, G. M., Igumbor, E., Zambou, S., Joubert, D. P.

Publication date: 1 Dec 2019

Peer-reviewed: Yes

#### **Publication information**

Journal: Computational Condensed Matter

Volume: 21

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ISSN (Print): 2352-2143

Original language: English

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Materials Science (miscellaneous), Condensed Matter Physics, Materials Chemistry

Keywords: Chalcopyrites, First principles, Solar cell efficiency

DOIs:

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Source ID: 85065198754

Research output: Contribution to journal > Article > Scientific > peer-review

### **DroneRF dataset: A dataset of drones for RF-based detection, classification and identification**

Modern technology has pushed us into the information age, making it easier to generate and record vast quantities of new data. Datasets can help in analyzing the situation to give a better understanding, and more importantly, decision making. Consequently, datasets, and uses to which they can be put, have become increasingly valuable commodities. This article describes the DroneRF dataset: a radio frequency (RF) based dataset of drones functioning in different modes, including off, on and connected, hovering, flying, and video recording. The dataset contains recordings of RF activities, composed of 227 recorded segments collected from 3 different drones, as well as recordings of background RF activities with no drones. The data has been collected by RF receivers that intercepts the drone's communications with the flight control module. The receivers are connected to two laptops, via PCIe cables, that runs a program responsible for fetching, processing and storing the sensed RF data in a database. An example of how this dataset can be interpreted and used can be found in the related research article "RF-based drone detection and identification using deep learning approaches: an initiative towards a large open source drone database" (Al-Sa'd et al., 2019).

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Computing Sciences, Qatar University

Contributors: Allahham, M. S., Al-Sa'd, M. F., Al-Ali, A., Mohamed, A., Khattab, T., Erbad, A.

Publication date: 1 Oct 2019

Peer-reviewed: Yes

#### **Publication information**

Journal: Data in Brief

Volume: 26

Article number: 104313

ISSN (Print): 2352-3409

Original language: English

ASJC Scopus subject areas: General

Keywords: Anti-drone systems, Classification, Drone identification, UAV detection

DOIs:

10.1016/j.dib.2019.104313

Source: Scopus

Source ID: 85071552598

Research output: Contribution to journal › Article › Scientific › peer-review

### **Automatization and stress analysis data of CoCr laser weld fatigue tests**

This work includes raw and analyzed test data when using a recently developed fatigue test method for miniature laser welds in cobalt-chromium (CoCr) alloy joints [1]: 10.1016/j.jmbbm.2019.07.004. The automatization of fatigue tests is crucial for saving costs and personnel resources and that is the reason why the automatization threshold and the resulting spectrum data related to CoCr welds are provided here. The finite element method based stress computation output is provided related to shearing-mode tests to support the dataset as a whole. In addition, the compositional data of the parent material and the laser weld are given.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Materials Science and Environmental Engineering, Research group: Plastics and Elastomer Technology, Orton Orthopaedic Hospital, Surface and Corrosion Science

Contributors: Kanerva, M., Besharat, Z., Pärnänen, T., Jokinen, J., Honkanen, M., Sarlin, E., Göthelid, M., Schlenzka, D.

Publication date: 1 Oct 2019

Peer-reviewed: Yes

#### **Publication information**

Journal: Data in Brief

Volume: 26

Article number: 104374

ISSN (Print): 2352-3409

Original language: English

ASJC Scopus subject areas: General

Keywords: Automatization, CoCr, Fatigue, Laser, Testing, Welding

DOIs:

10.1016/j.dib.2019.104374

#### **Bibliographical note**

EXT="Pärnänen, T."

Source: Scopus

Source ID: 85072173471

Research output: Contribution to journal › Article › Scientific › peer-review

### **Diffusion of innovation: Case of co-design of cabins in mobile work machine industry**

This paper describes the development of using virtual reality for work content in one application area over a decade. Virtual reality technology has developed rapidly; from walk-in CAVE-like virtual environments to head-mounted displays within a decade. In this paper, the development is studied through the lens of diffusion of innovation theory, which focuses not only on innovation itself, but also on the social system. The development of virtual technology is studied by one case, which is cabin design in the mobile work machine industry. This design process has been especially suitable for using virtual reality technology.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Automation Technology and Mechanical Engineering, Tampere University

Contributors: Ellman, A., Tiainen, T.

Publication date: 1 Jun 2019

Peer-reviewed: Yes

#### **Publication information**

Journal: Computers

Volume: 8

Issue number: 2

Article number: 39

ISSN (Print): 2073-431X

Original language: English

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Keywords: Cabin design, Diffusion of innovation, Virtual reality

Electronic versions:

computers-08-00039

DOIs:

10.3390/computers8020039

URLs:

<http://urn.fi/URN:NBN:fi:tty-201909062077>

Source: Scopus

Source ID: 85069801135

Research output: Contribution to journal > Article > Scientific > peer-review

## **Accurate impedance model of grid-connected inverter for small-signal stability assessment in high-impedance grid**

### **General information**

Publication status: Accepted/In press

MoE publication type: A1 Journal article-refereed

Organisations: Electrical Engineering, Research area: Power engineering, Research group: Power electronics, Automation Technology and Mechanical Engineering, Research group: Automation and Systems Theory

Contributors: Messo, T., Roinila, T., Aapro, A., Luhtala, R.

Publication date: 1 Feb 2019

Peer-reviewed: Yes

### **Publication information**

Journal: IEEJ JOURNAL OF INDUSTRY APPLICATIONS

Volume: 8

Issue number: 3

Article number: 3

ISSN (Print): 2187-1094

Original language: English

DOIs:

10.23919/IPEC.2018.8507573

Research output: Contribution to journal > Article > Scientific > peer-review

## **Modelling the stressed skin effect by using shell elements with meta-material model**

It is a well-known fact that the so-called stressed skin design results in ca. 10-20 % mass and cost savings in a typical steel hall structures. The potential of this design method is however, too often disregarded due to e.g. rather complex and limited existing design rules and instructions. In this paper, a method for determination of generalized elastic parameters is proposed, so that the stressed skin can be modelled in the general finite element software using existing elements and material parameters. With the proposed method, structural designer can take advantage of the stressed skin design in the context of basic design tools as Autodesk Robot or RFEM.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Civil Engineering, Sorvimo Optimointipalvelut Oy

Contributors: Pajunen, S., Hautala, J., Heinisuo, M.

Number of pages: 10

Pages: 20-29

Publication date: 2019

Peer-reviewed: Yes

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Journal: Magazine of Civil Engineering

Volume: 86

Issue number: 2

ISSN (Print): 2071-4726

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ASJC Scopus subject areas: Civil and Structural Engineering, Building and Construction

Keywords: Corrugated sheet, Diaphragm, Stressed skin

Electronic versions:

03-1

DOIs:

10.18720/MCE.86.3

URLs:

<http://urn.fi/URN:NBN:fi:tty-201909022051>

### **Bibliographical note**

EXT="Heinisuo, M."

Source: Scopus

Source ID: 85068566348

Research output: Contribution to journal > Article > Scientific > peer-review

### **Experimental moment resistance of rectangular hollow section T joints**

Resistance is the main property of tubular joints. The determination of the joint resistance from the experimental load-deformation curve always represents a challenging task. Currently there are two main methods to find the experimental resistance, which are called plastic and ultimate resistance. However, there is no single opinion on which one should be commonly used. Based on the experimental results, this paper directly compares the two existed approaches. The study is restricted to welded square hollow section T joints under in-plane bending moment. The paper considers only the joints with  $\beta < 0.85$ , i.e. when the behaviour of the joint is governed by chord face failure. The results show that plastic resistance leads to more conservative results than ultimate resistance, providing thus safer results. However, attention should be also paid to the difference between the labour intensity of the presented methods.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Civil Engineering

Contributors: Garifullin, M.

Publication date: 5 Dec 2018

Peer-reviewed: Yes

### **Publication information**

Journal: MATEC Web of Conferences

Volume: 245

Article number: 08003

ISSN (Print): 2274-7214

Ratings:

Scopus rating (2018): CiteScore 0.42 SJR 0.169 SNIP 0.548

Original language: English

ASJC Scopus subject areas: Chemistry(all), Materials Science(all), Engineering(all)

Electronic versions:

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DOIs:

10.1051/matecconf/201824508003

URLs:

<http://urn.fi/URN:NBN:fi:ty-201901091034>

Source: Scopus

Source ID: 85058463414

Research output: Contribution to journal > Conference article > Scientific > peer-review

### **Tutkimuskatsaus: Uusia menetelmiä haavan paranemisen arviointiin ja seurantaan**

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Faculty of Biomedical Sciences and Engineering, Turku Univ Hosp, University of Turku, Åbo Akademi

Contributors: Kekonen, A., Bergelin, M., Viik, J.

Number of pages: 3

Pages: 30-32

Publication date: 20 Oct 2018

Peer-reviewed: Yes

#### **Publication information**

Journal: HAAVA

Volume: 20

Issue number: 3

ISSN (Print): 1456-3037

Original language: Finnish

ASJC Scopus subject areas: Biomedical Engineering, Dermatology

Research output: Contribution to journal > Article > Scientific > peer-review

### **Evaluation of Median Root Prior for Robust In-Beam PET Reconstruction**

Dose delivery verification in proton beam radiotherapy is used to ensure the delivery of the dose to the correct location. A positron emission tomography (PET) scanner can be used to detect the secondary radiation during the treatment, so-called in-beam PET. This is a challenging application for PET due to the low counts and limited angular coverage. We propose a maximum a posteriori (MAP) reconstruction with median root prior (MRP) for the reconstruction of in-beam PET data. The proposed method was compared against MAP with total variation (TV) prior and maximum likelihood expectation maximization (MLEM), which have previously been used for this application. The effects of different ring configurations and time-of-flight information were tested with simulations of a geometrical phantom and a realistic patient treatment plan. The results indicate that both MAP methods produced sharper edges than MLEM, allowing more accurate edge localization in the reconstructed images. Even for the partial ring configurations, no elongation was observed with MAP methods. MAP-MRP successfully reduced the noise, whereas MAP-TV resulted in checkerboard artifacts. MAP-MRP was also more stable against the selection of the reconstruction parameters. In conclusion, MAP-MRP offers a simple and robust alternative for the reconstruction of in-beam PET data.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Mathematics, Signal Processing, Research group: M2oBSI, University of Groningen

Contributors: Us, D., Brzezinski, K., Buitenhuis, T., Dendooven, P., Ruotsalainen, U.

Number of pages: 8

Pages: 490-498

Publication date: 5 Sep 2018

Peer-reviewed: Yes

#### **Publication information**

Journal: IEEE Transactions on Radiation and Plasma Medical Sciences

Volume: 2

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ISSN (Print): 2469-7303

Original language: English

DOIs:

10.1109/TRPMS.2018.2854231

Research output: Contribution to journal › Article › Scientific › peer-review

### **Effect of radiation inside square hollow section under moderate non-symmetric fire**

The temperature calculation of hollow steel sections at elevated temperatures is a well-documented and standard procedure. Through this standard procedure, the temperature can be calculated by assuming a uniform gas temperature all around the section, which is called a symmetric fire in this paper. Embedding in surrounding structures or connecting to another steel member results in non-symmetric heat distribution in the member. This non-symmetry of the surrounding temperature may cause surface-to-surface heat radiation inside the member, thus affecting the steel section temperature distribution. This effect is considered in this paper by adopting analytical and finite element method analysis.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Civil Engineering, Research group: Metal and Light-wight structures, Research group: Metal and Light-wight structures

Contributors: Baczkiewicz, J., Pajunen, S., Heinisuo, M.

Number of pages: 6

Pages: 25-30

Publication date: 27 Jul 2018

Peer-reviewed: Yes

#### **Publication information**

Journal: Fire Research

Volume: 2

Issue number: 1

Article number: 2:42

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Keywords: Steel member, Hollow section, Heat transfer, Radiation

Electronic versions:

42-Article Text-486-2-10-20180822-1

DOIs:

10.4081/fire.2018.42

URLs:

<http://urn.fi/URN:NBN:fi:tty-201811192630>

Research output: Contribution to journal > Article > Scientific > peer-review

### **Effect of elevated nitrate and sulfate concentrations on selenate removal by mesophilic anaerobic granular sludge bed reactors**

Simultaneous removal of selenate (SeO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>) and sulfate (SO<sub>4</sub><sup>2-</sup>), typically present in Se-contaminated wastewaters, by Eerbeek anaerobic granular sludge, was investigated in batch and continuous bioreactor experiments. Batch experiments showed that SeO<sub>4</sub><sup>2-</sup> removal was enhanced to 91% in simulated wastewater with SeO<sub>4</sub><sup>2-</sup> + NO<sub>3</sub><sup>-</sup> + SO<sub>4</sub><sup>2-</sup> (1 : 40 : 100 SeO<sub>4</sub><sup>2-</sup> : NO<sub>3</sub><sup>-</sup> : SO<sub>4</sub><sup>2-</sup> molar ratios) compared to simulated wastewater with SeO<sub>4</sub><sup>2-</sup> alone (67%). SeO<sub>4</sub><sup>2-</sup> removal was severely impacted by high concentrations of SO<sub>4</sub><sup>2-</sup> (SeO<sub>4</sub><sup>2-</sup> : SO<sub>4</sub><sup>2-</sup> > 1 : 300). Removal of SeO<sub>4</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup> and SO<sub>4</sub><sup>2-</sup> at a 1 : 40 : 100 ratio was studied in a 2 L lab-scale upflow anaerobic sludge blanket (UASB) reactor operated at 20 [degree]C, a 24 h hydraulic retention time and a 2 g COD L<sup>-1</sup> day<sup>-1</sup> organic loading rate using lactate as the electron donor. The removal efficiencies were stabilized at 100, 30 and 80% for NO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup> and total Se, respectively, during 92 days of UASB operation. The total Se removal efficiencies dropped to 47% or even to a negative value when, respectively, SO<sub>4</sub><sup>2-</sup> and NO<sub>3</sub><sup>-</sup> were sequentially excluded from the influent. Speciation of Se, particularly the microbial production of colloidal Se<sub>0</sub> levels, was influenced by both SO<sub>4</sub><sup>2-</sup> and NO<sub>3</sub><sup>-</sup>. The results presented here demonstrate that UASB reactors are capable of removing SeO<sub>4</sub><sup>2-</sup> in the presence of millimolar concentrations of NO<sub>3</sub><sup>-</sup> and SO<sub>4</sub><sup>2-</sup> typically found in Se-contaminated wastewaters.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Chemistry and Bioengineering, UNESCO-IHE Institute for Water Education

Contributors: Tan, L. C., Nancharaiah, Y. V., van Hullebusch, E. D., Lens, P. N. L.

Pages: 303-314

Publication date: 2018

Peer-reviewed: Yes

Early online date: 5 Dec 2017

#### **Publication information**

Journal: Environmental Science: Water Research & Technology

Volume: 4

Issue number: 2

ISSN (Print): 2053-1400

Ratings:

Scopus rating (2018): CiteScore 4.02 SJR 1.104 SNIP 1.081

Original language: English

DOIs:

10.1039/C7EW00307B

Source: Bibtext

Source ID: urn:83b997c5e222c3328f8a2e876e3d3da8

Research output: Contribution to journal > Article > Scientific > peer-review

### **In vitro characterization of arylhydrazones of active methylene derivatives**

Arylhydrazones of active methylene compounds (AHAMCs) are potent chemotherapy agents for the cancer treatment. AHAMCs enhance the apoptotic cell death and antiproliferation properties in cancer cells. In this study, a series of AHAMCs, 13 compounds, was assayed for cytotoxicity, apoptosis, externalization of phosphatidylserine, heterogeneity and cellular calcium level changes. The in vitro cytotoxicity study against HEK293T cells suggests that AHAMCs have significant cytotoxic effect over the concentrations. Top 5 compounds, 5-(2-(2-hydroxyphenyl) hydrazono)pyrimidine-2,4,6(1H,3H,5H)-trione (5), 4-hydroxy-5-(2-(2,4,6-trioxo-tetrahydro-pyrimidin-5(6H) ylidene)hydrazinyl)benzene-1,3-disulfonic acid (6), 5-chloro-3-(2-(4,4-dimethyl-2,6-dioxocyclohexylidene)hydrazinyl)-2-hydroxybenzenesulfonic acid (8), 5-(2-(4,4-dimethyl-2,6-dioxocyclohexylidene)hydrazinyl)-4-hydroxybenzene-1,3-disulfonic acid (9) and 2-(2-sulfophenylhydrazo)malononitrile (10) were chosen for the pharmacodynamics study. Among these, compound 5 exhibited the better cytotoxic effect with the IC<sub>50</sub> of 50.86 ± 2.5 mM. DNA cleavage study revealed that 5 induces cell death through apoptosis and shows more effects after 24 and/or 48 h. Independent validation of apoptosis by following the externalization of phosphatidylserine using Annexin-V is also in agreement with the potential activity of 5. Single cell image analysis of Annexin-V bound cells confirms the presence of mixture of early, mid and late apoptotic cells in the population of the cells treated with 5 and a decreased trend in cell-to-cell variation over the phase was also identified. Additionally, intracellular calcium level measurements identified the Ca<sup>2+</sup> up-regulation in compound treated cells. A brief inspection of the effect of the compound 5 against multiple human brain astrocytoma cells showed a better cell growth inhibitory effect at micro molar level. These systematic studies provide insights in the development of novel AHAMCs compounds as

potential cell growth inhibitors for cancer treatment.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Computational Systems Biology, Peoples' Friendship University of Russia, Baku State University, Centro de Quimica Estrutural at Instituto Superior Tecnico

Contributors: Palanivel, S., Zhurina, A., Doan, P., Chandraseelan, J. G., Khandelwal, V. K. M., Zubkov, F. I., Mahmudov, K. T., Pombeiro, A. J., Yli-Harja, O., Kandhavelu, M.

Pages: 430-436

Publication date: 2018

Peer-reviewed: Yes

#### Publication information

Journal: Saudi Pharmaceutical Journal

Volume: 26

Issue number: 3

ISSN (Print): 1319-0164

Ratings:

Scopus rating (2018): CiteScore 3.48 SJR 0.67 SNIP 1.925

Original language: English

ASJC Scopus subject areas: Pharmacology, Pharmaceutical Science

Keywords: Apoptosis, Arylhydrazones of active methylene compounds, Chemotherapy, Cytotoxic effect, Glioma, Immortal cells, Single cell analysis

Electronic versions:

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DOIs:

10.1016/j.jsps.2017.12.018

URLs:

<http://urn.fi/URN:NBN:fi:itty-201803161382>

Source: Scopus

Source ID: 85039901326

Research output: Contribution to journal > Article > Scientific > peer-review

#### Cold-formed RHS T joints with initial geometrical imperfections

Generally, numerical simulations of structures are carried out in such a way as to most accurately repeat their real behavior. The current rules for finite element modeling of tubular joints oblige scientists and engineers to construct their numerical models considering initial imperfections. However, not all joints are sensitive to initial imperfections. Often consideration of initial imperfections brings no reasonable improvements in the accuracy of results, but severely complicates numerical simulations. In such cases, the effect of geometrical imperfections can be effectively replaced by a simple theoretical equation or neglected entirely. This paper evaluates the effect of initial geometrical imperfections on the structural behavior of cold-formed rectangular hollow section T joints. Imperfections are simulated using the conventional approach for thin-walled structures, applying corresponding buckling modes to the perfect geometry. The paper analyzes several buckling modes and their combinations to identify the most rational technique for simulation of imperfections under in-plane bending and axial loading. Based on the obtained results, parametric studies are conducted to investigate the effect of initial imperfections on joints with various geometry and material properties. The results demonstrate that initial imperfections reduce the resistance and initial stiffness of joints. However, the observed effect has been found sufficiently small to be safely ignored in computational analyses.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Civil Engineering, St. Petersburg State Polytechnical University

Contributors: Garifullin, M., Bronzova, M. K., Heinisuo, M., Mela, K., Pajunen, S.

Number of pages: 14

Pages: 81-94

Publication date: 2018

Peer-reviewed: Yes

#### Publication information

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Volume: 80

Issue number: 4

ISSN (Print): 2071-4726

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Scopus rating (2018): CiteScore 2.75 SJR 1.062 SNIP 2.28

Original language: English

ASJC Scopus subject areas: Civil and Structural Engineering, Building and Construction

Keywords: Finite element analysis, Hollow section joint, Imperfection, Initial stiffness, Resistance

Electronic versions:

cold-formed\_rhs\_t\_joints

DOIs:

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URLs:

<http://urn.fi/URN:NBN:fi:tuni-201910033677>

Source: Scopus

Source ID: 85051540096

Research output: Contribution to journal > Article > Scientific > peer-review

### 基于相位旋转的SCMA码本优化方法

To solve the high bit error ratio (BER) problem under the condition of high overload of sparse code multiple access (SCMA), the influence of phase rotation on the SCMA code is studied firstly. Two schemes of optimizing the phase rotation angle are then proposed based on the controlled-distance among the constellation points of synthetic constellation. The first scheme is called the rotation based on maximizing minimum euclidean distance (M-rotation) and the second is the rotation based on exponential average (E-rotation). E-rotation achieves better BER performance than M-rotation, but M-rotation is outstanding at the case of high signal-to-noise ratio (SNR). With respect to the decoding complexity, both schemes have no distinction but E-rotation gets better performance than M-rotation when the partial extrinsic information transmission of MPA (PEIT-MPA) is adopted.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Electronics and Communications Engineering, Chongqing University of Posts and Telecommunications, Huawei Technologies Co., Ltd.

Contributors: Shao, K., Zhou, B., Wang, G., Yu, B.

Number of pages: 9

Pages: 2354-2362

Publication date: 2018

Peer-reviewed: Yes

### Publication information

Journal: Xi Tong Gong Cheng Yu Dian Zi Ji Shu/Systems Engineering and Electronics

Volume: 40

Issue number: 10

ISSN (Print): 1001-506X

Ratings:

Scopus rating (2018): CiteScore 0.58 SJR 0.198 SNIP 0.446

Original language: Chinese

ASJC Scopus subject areas: Control and Systems Engineering, Electrical and Electronic Engineering

Keywords: Codebook design, Phase rotation, Sparse code multiple access (SCMA), Synthetic constellation

DOIs:

10.3969/j.issn.1001-506X.2018.10.29

Source: Scopus

Source ID: 85056877151

Research output: Contribution to journal > Article > Scientific > peer-review

### Core Project Team As a Management Entity for Construction Projects

The complexity of constructed facilities and the high degree of specialisation in design and construction generates very fragmented working environment for the construction project. Construction project organisations are built up from the units of organisations and they have arranged rules and procedures about how practicalities are to be done. A current perception of construction management is widely built around power, authority, and task orientation. This is resulting from the traditional focus of the construction industry on the technical and managerial features of construction projects. Organisations of construction projects vary substantially in their structure and this structure has considerable consequences to outcomes. Therefore, project management professionals continuously seek and establish new organisational and management structures and linkages to facilitate imperative cooperation between people and project partners. New understanding and amendments are broadening the content of construction project management and have provided new insights for successful construction operations. This paper is based on research according to this continuum by having focus on the appearances of management entity of a new kind, its significance and roles as a part of



construction project management. The paper sought to summarize this literature and the survey study by focusing on the project management entity "core project team", later "core team". Drawing from this inclusive, the phenomenon of core team, the authors approach the field through six attributes, which have been selected to describe the new way for organising project management.

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Civil Engineering, Research group: Digitalization in the real estate and construction sector  
Contributors: Keinänen, M., Kähkönen, K.  
Number of pages: 10  
Pages: 208-217  
Publication date: 2018  
Peer-reviewed: Yes

#### Publication information

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Volume: 9  
Issue number: 13  
ISSN (Print): 2036-1602  
Original language: English  
ASJC Scopus subject areas: Civil and Structural Engineering  
Keywords: Core project team, Core team, Construction management, Construction project, Construction teams  
Electronic versions:  
Core Project Team As a Management Entity for Construction Projects  
URLs:  
[https://in\\_bo.unibo.it/issue/view/751/showToc](https://in_bo.unibo.it/issue/view/751/showToc)  
<http://urn.fi/URN:NBN:fi:tty-201901281176>  
Research output: Contribution to journal › Article › Scientific › peer-review

#### Kehittämistutkimus: vuorovaikusteisten Matlab-opetusohjelmien vaikutus minäpystyvyyteen ja oppimistuloksiin yliopistomatematiikassa

#### General information

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MoE publication type: A1 Journal article-refereed  
Organisations: Mathematics, Research group: Computer Science and Applied Logics, Research group: Positioning  
Contributors: Kaarakka, T. E., Ali-Löytty, S., Huhtanen, M.  
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Pages: 67-77  
Publication date: 2018  
Peer-reviewed: Yes

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Volume: 2  
Issue number: 1  
ISSN (Print): 2489-4583  
Original language: Finnish  
URLs:  
<https://journal.fi/fmsera/issue/view/5356>  
Research output: Contribution to journal › Article › Scientific › peer-review

#### Yliopistomatematiikan sähköisten tehtävien ja matemaattisen ajattelun kehittäminen

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Mathematics, Research group: Positioning, Research group: Computer Science and Applied Logics  
Contributors: Myllykoski, T. J., Mattila, P., Ali-Löytty, S., Kaarakka, T., Viro, E.  
Number of pages: 11  
Pages: 46-56  
Publication date: 2018  
Peer-reviewed: Yes

### Publication information

Journal: FMSERA Journal

Volume: 2

Issue number: 1

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URLs:

<https://journal.fi/fmsera/article/view/69887/38422>

Additional files:

Myllykoski\_et\_al

Research output: Contribution to journal > Article > Scientific > peer-review

### Projektityöskentelyn kehittäminen yläkoulun matematiikan opetuksessa

Perusopetuksen opetussuunnitelman perusteiden 2014 aikana ovat ilmiölähtöinen oppiminen ja projektiluontoinen työskentely lisääntyneet peruskouluissa merkittävästi. Tässä tutkimuksessa tarkastellaan oppilaan ja opettajan näkökulmasta lähinnä yläkoulun matematiikan opetukseen liitetyn projektityöskentelyn kehittämiskohteita sekä niihin mahdollisia kehittämisehdotuksia. Tutkimusaineistoa on kerätty kyselylomakkeilla ja havainnoinnilla LUMA Suomen Projektioppiminen-kehittämishankkeesta, StarT-projektikilpailusta ja Teknologiateollisuuden My Tech –ohjelmasta. Tutkimukseen osallistui 365 oppilasta ja 19 opettajaa. Projektityöskentelyn suurimmat haasteet voidaan luokitella oppilaan ja opettajan toimintaan, itse projektiin tai koulutoiminnan puitteisiin liittyviksi. Jokaiseen osa-alueeseen opettaja voi omalla toiminnallaan vaikuttaa.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Mathematics, Tampereen yliopisto

Contributors: Viro, I. E., Joutsenlahti, J.

Number of pages: 10

Pages: 90-99

Publication date: 2018

Peer-reviewed: Yes

### Publication information

Journal: FMSERA Journal

Volume: 2

Issue number: 1

ISSN (Print): 2489-4583

Original language: Finnish

URLs:

<https://journal.fi/fmsera/article/view/69879>

Research output: Contribution to journal > Article > Scientific > peer-review

### Analysis of outdoor and indoor propagation at 15 GHz and millimeter wave frequencies in microcellular environment

The main target of this article is to perform the multidimensional analysis of multipath propagation in an indoor and outdoor environment at higher frequencies i.e. 15 GHz, 28 GHz and 60 GHz, using "sAGA" a 3D ray tracing tool. A real world outdoor Line of Sight (LOS) microcellular environment from the Yokusuka city of Japan is considered for the analysis. The simulation data acquired from the 3D ray tracing tool includes the received signal strength, power angular spectrum and the power delay profile. The different propagation mechanisms were closely analyzed. The simulation results show the difference of propagation in indoor and outdoor environment at higher frequencies and draw a special attention on the impact of diffuse scattering at 28 GHz and 60 GHz. In a simple outdoor microcellular environment with a valid LOS link between the transmitter and a receiver, the mean received signal at 28 GHz and 60 GHz was found around 5.7 dB and 13 dB inferior in comparison with signal level at 15 GHz. Whereas the difference in received signal levels at higher frequencies were further extended in an indoor environment due to higher building penetration loss. However, the propagation and penetration loss at higher frequency can be compensated by using the antenna with narrow beamwidth and larger gain.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Electrical Engineering, Research group: Laboratory of Radio Network Planning, Research group: Wireless Communications and Positioning

Contributors: Sheikh, M. U., Lempinen, J.

Number of pages: 8

Pages: 160-167

Publication date: 2018

Peer-reviewed: Yes

### Publication information

Journal: Advances in Science, Technology and Engineering Systems

Volume: 3

Issue number: 1

ISSN (Print): 2415-6698

Original language: English

ASJC Scopus subject areas: Engineering (miscellaneous), Management of Technology and Innovation, Physics and Astronomy (miscellaneous)

Keywords: 3D ray tracing, 5G, Microcellular, Millimeter wave frequencies, Multipath propagation, System performance

DOIs:

10.25046/aj030120

Source: Scopus

Source ID: 85061718805

Research output: Contribution to journal › Article › Scientific › peer-review

### Enhanced outdoor to indoor propagation models and impact of different ray tracing approaches at higher frequencies

The main target of this article is to study the provision of indoor service (coverage) using outdoor base station at higher frequencies i.e. 10 GHz, 30 GHz and 60 GHz. In an outdoor to indoor propagation, an angular wall loss model is used in the General Building Penetration (GBP) model for estimating the additional loss at the intercept point of the building exterior wall. A novel angular wall loss model based on a separate incidence angle in azimuth and elevation plane is proposed in this paper. In the second part of this study, an Extended Building Penetration (EBP) model is proposed, and the performance of EBP model is compared with the GBP model. In EBP model, the additional fifth path known as the "Direct path" is proposed to be included in the GBP model. Based on the evaluation results, the impact of the direct path is found significant for the indoor users having the same or closed by height as that of the height of the transmitter. For the indoor users located far away from the exterior wall of building, a modified and enhanced approach of ray tracing type is proposed in this article. In the light of acquired simulation results, the impact of a modified ray tracing approach is emphasized.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Electrical Engineering, Research group: Laboratory of Radio Network Planning, Research group: Wireless Communications and Positioning, Ericsson Research

Contributors: Sheikh, M. U., Hiltunen, K., Lempiainen, J.

Number of pages: 11

Pages: 58-68

Publication date: 2018

Peer-reviewed: Yes

### Publication information

Journal: Advances in Science, Technology and Engineering Systems

Volume: 3

Issue number: 2

ISSN (Print): 2415-6698

Original language: English

ASJC Scopus subject areas: Engineering (miscellaneous), Management of Technology and Innovation, Physics and Astronomy (miscellaneous)

Keywords: Angular loss, Building penetration loss, Outdoor to indoor, Propagation, Ray tracing, Wall loss model

DOIs:

10.25046/aj030207

Source: Scopus

Source ID: 85061801748

Research output: Contribution to journal › Article › Scientific › peer-review

### Electro-optic steering of random laser emission in liquid crystals

Using an external low-frequency electric field applied to dye-doped nematic liquid crystals, we demonstrate that random lasing obtained by optical pumping can be steered in an angular direction by routing an all-optical waveguide able to collect the emitted light. By varying the applied voltage from 0 to 2 V, we reduce the walk-off and sweep the random laser guided beam over 7 degrees.

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Physics, Research group: Nonlinear Optics, University of Rome Roma Tre, University "Roma Tre"  
Contributors: Assanto, G., Perumbilavil, S., Piccardi, A., Kauranen, M.  
Number of pages: 3  
Pages: 103-105  
Publication date: 2018  
Peer-reviewed: Yes

#### Publication information

Journal: Photonics Letters of Poland

Volume: 10

Issue number: 4

ISSN (Print): 2080-2242

Ratings:

Scopus rating (2018): CiteScore 0.52 SJR 0.214 SNIP 0.348

Original language: English

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials

DOIs:

10.4302/plp.v10i4.852

Source: Scopus

Source ID: 85062032353

Research output: Contribution to journal > Article > Scientific > peer-review

#### Assessing the usefulness of an early idea development tool among experienced researchers

We test a novel ideation tool developed for early idea development among experienced academic researchers. We presented the Impact Canvas® tool to experienced researchers who assessed the usefulness of the tool in early idea development. This paper analyses their perceptions of the tool: its usability and visual appeal, content elements, ability to facilitate collaboration and motivate them personally. Our findings imply that the employment background of experienced researchers has an impact on how useful they consider the tool. Researchers with a background in the public sector appreciate the tool significantly more than researchers who do not have similar working experiences.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Industrial and Information Management, Research group: Center for Innovation and Technology Research, Innovation Services, Research Services, University of Tampere

Contributors: Saari, U., Aarikka-Stenroos, L., Boedeker, S., Köppä, L., Langwaldt, J.

Number of pages: 6

Pages: 3-8

Publication date: 22 Dec 2017

Peer-reviewed: Yes

#### Publication information

Journal: CERN IdeaSquare Journal of Experimental Innovation

Volume: 1

Issue number: 2

ISSN (Print): 2413-9505

Original language: English

Keywords: Canvas tool, Early idea development, Ideation process, Ideation tool

Electronic versions:

476-2180-2-PB

DOIs:

10.23726/cij.2017.476

URLs:

<http://urn.fi/URN:NBN:fi:tyy-201801311182>

Research output: Contribution to journal > Article > Scientific > peer-review

## Sata vuotta vesihuoltoa Suomessa

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Civil Engineering  
Contributors: Juuti, P., Katko, T. S., Rajala, R.  
Number of pages: 3  
Pages: 13-15  
Publication date: Dec 2017  
Peer-reviewed: Yes

### Publication information

Journal: Vesitalous  
Volume: 58  
Issue number: 6  
ISSN (Print): 0505-3838  
Original language: Finnish  
Research output: Contribution to journal › Article › Scientific › peer-review

## Probabilistic Mapping of Human Visual Attention from Head Pose Estimation

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Automation and Hydraulic Engineering, Aalto University School of Electrical Engineering  
Contributors: Veronese, A., Racca, M., Pieters, R., Kyrki, V.  
Number of pages: 11  
Publication date: 30 Oct 2017  
Peer-reviewed: Yes

### Publication information

Journal: Frontiers in Robotics and AI  
Article number: 53  
ISSN (Print): 2296-9144  
Ratings:  
Scopus rating (2017): SNIP 1.448  
Original language: English  
Electronic versions:  
frobt-04-00053  
DOIs:  
10.3389/frobt.2017.00053  
URLs:  
<http://urn.fi/URN:NBN:fi:ty-201712142366>  
Research output: Contribution to journal › Article › Scientific › peer-review

## Inkjet printed metallic micropillars for bare die flip-chip bonding

Inkjet printed metal micropillars have been developed to help meet the demands for novel and highly adaptable microelectronics fabrication processes. The digitally printed silver pillar arrays in this study have been utilized in place of wafer-level solder bump processes or chip-level wire-bonded stud bumps. These three-dimensional silver pillars were printed with a drop-on-demand piezoelectric inkjet printer utilizing silver nanoparticle ink. The inkjet printed micropillars were found to have 22  $\mu\text{m}$  diameters and a height equivalent to approximately 3  $\mu\text{m}$  per droplet. In our study, we chose pillars for further use as stud bumps with 8, 10, 12 and 14 droplets, with heights of approximately 20.9  $\mu\text{m}$ , 25.9  $\mu\text{m}$ , 33.3  $\mu\text{m}$  and 35.9  $\mu\text{m}$  respectively. After printing on the bare dies the bumps were subsequently used to increase the contact reliability of flip-chip bonded samples. It was found that the bumped chips dramatically improved the reliability of the I/O connection as compared to unbumped samples. In fact nearly 88% of the bumped pads had a resistance less than 2.5  $\Omega$ /bump (no noticeable variation between bump heights) as compared to 17% for the unbumped bare dies. This study clearly demonstrates the fabrication of inkjet printed silver micropillars for use in uniform stud bump arrays. Furthermore, the feasibility of incorporating inkjet printed silver stud bumps for use in flip-chip fabrication methods was demonstrated.

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Electronics and Communications Engineering, Research group: Laboratory for Future Electronics

Contributors: Khorrarnadel, B., Kraft, T. M., Mäntysalo, M.  
Pages: 045005  
Publication date: 26 Oct 2017  
Peer-reviewed: Yes

#### Publication information

Journal: Flexible and Printed Electronics  
Volume: 2

Issue number: 4  
ISSN (Print): 2058-8585  
Ratings:

Scopus rating (2017): CiteScore 2.68 SJR 0.779 SNIP 1.163

Original language: English

Electronic versions:

Khorrarnadel Kraft Mantysalo - 2017 - Inkjet printed metallic micropillars for bare-die flip-chip bonding

DOIs:

10.1088/2058-8585/aa9171

URLs:

<http://urn.fi/URN:NBN:fi:ty-201901291191>

Source: Bibtex

Source ID: urn:8f4049c2ab7f16fab13e340ca8b6ef9

Research output: Contribution to journal > Article > Scientific > peer-review

#### The effect of tungsten carbide particles content in a weld deposit on its abrasion resistance

This paper describes the study of a weld deposit which contains tungsten carbide particles. For testing the process of gas metal arc welding in a protective atmosphere of a mixed gas with two types of cored wires were used. The selected cored electrode of a "F-Durit G" type already contains the tungsten carbide particles. The second used option was a cored electrode of a "Megafil A 864M" type with an increased boron content. For the second variant tungsten carbide particles with a 1-2 mm size were added to the weld pool, and a composite material layer was thus created. For the mentioned test two different levels of welding parameters were selected and the final weld deposit properties, particularly their abrasion resistance, were examined.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Materials Science, VSB-Technical University Ostrava, Czech Republic, University of Osijek

Contributors: Hlavatý, I., Kozák, J., Krejci, L., Samardzic, I., Tuominen, J.

Number of pages: 5

Pages: 1345-1349

Publication date: Oct 2017

Peer-reviewed: Yes

#### Publication information

Journal: Technical Gazette - Technicki vjesnik

Volume: 24

Issue number: 5

ISSN (Print): 1848-6339

Original language: English

Keywords: Hardfacing, Metal matrix composite, Gas metal arc welding, Abrasive wear

Electronic versions:

tv\_24\_2017\_5\_1345\_1349-1

DOIs:

10.17559/TV-20160503085356

URLs:

<http://urn.fi/URN:NBN:fi:ty-201710312093>

Research output: Contribution to journal > Article > Scientific > peer-review

#### Comparative investigation of remote tracking devices for aging care

Tracking devices help the elderly patients to remain safe, secure and traceable in case of getting lost or in an emergency. This research work was conducted to evaluate the appropriateness of few commercially available tracking devices for aging people, by identifying their usefulness, efficiency, limitations and further improvements. Research involved two steps; literature review about two existing tracking devices simply termed device A and device B, followed by a performance and comparative analysis of the aforementioned devices by applying basic statistics on the results obtained from a questionnaire survey. Devices were used by two groups of people: aging (>70 year old) and middle-aged patients

(less than 70 years old) who reported their satisfaction levels about the said devices on a scale of one to five. These devices were found helpful in reducing the dependency of the elderly on others and raised their privacy values. However, these were not recommended for severe memory loss or later stage of critical staged dementia patients because learning and memorizing the process of handling these devices can be difficult for them. Overall, the performance of device B outplayed device A while comparing all considered device parameters. The calling feature of device B appeared to be an appealing characteristic with mean satisfaction levels of 4.9 textpm 0.32 and 4.7 textpm 0.48 as reported by the middle-aged and aging groups, respectively. These devices will be helpful in decreasing unnecessary rush at health care centers or lost person reporting in police. In upcoming years, these devices can be developed to remotely monitor the movement of the patient.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Faculty of Biomedical Sciences and Engineering

Contributors: Munir, M. W., Shahid, N., Omair, S. M., Munir, G., UI Haque, M. Z.

Number of pages: 6

Pages: 261-266

Publication date: 1 Sep 2017

Peer-reviewed: Yes

#### **Publication information**

Journal: INTERNATIONAL JOURNAL OF INFORMATION TECHNOLOGY

Volume: 9

Issue number: 3

ISSN (Print): 2511-2112

Original language: English

DOIs:

10.1007/s41870-017-0034-7

Source: Bibtex

Source ID: urn:3fb5001f93a07dc83f4e1bd74b4d0420

Research output: Contribution to journal > Article > Scientific > peer-review

#### **NB-IoT for D2D-enhanced content uploading with social trustworthiness in 5G systems**

Future fifth-generation (5G) cellular systems are set to give a strong boost to the large-scale deployment of Internet of things (IoT). In the view of a future converged 5G-IoT infrastructure, cellular IoT solutions such as narrowband IoT (NB-IoT) and device-to-device (D2D) communications are key technologies for supporting IoT scenarios and applications. However, some open issues still need careful investigation. An example is the risk of threats to privacy and security when IoT mobile services rely on D2D communications. To guarantee efficient and secure connections to IoT services involving exchange of sensitive data, reputation-based mechanisms to identify and avoid malicious devices are fast gaining ground. In order to tackle the presence of malicious nodes in the network, this paper introduces reliability and reputation notions to model the level of trust among devices engaged in an opportunistic hop-by-hop D2D-based content uploading scheme. To this end, social awareness of devices is considered as a means to enhance the identification of trustworthy nodes. A performance evaluation study shows that the negative effects due to malicious nodes can be drastically reduced by adopting the proposed solution. The performance metrics that proved to benefit from the proposed solution are data loss, energy consumption, and content uploading time.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Electronics and Communications Engineering, Universita degli Studi di Reggio Calabria, Peoples' Friendship University of Russia

Contributors: Militano, L., Orsino, A., Araniti, G., Iera, A.

Publication date: 8 Jul 2017

Peer-reviewed: Yes

#### **Publication information**

Journal: Future Internet

Volume: 9

Issue number: 3

Article number: 31

ISSN (Print): 1999-5903

Ratings:

Scopus rating (2017): CiteScore 1.25 SJR 0.219 SNIP 0.906

Original language: English

ASJC Scopus subject areas: Computer Networks and Communications

Keywords: 5G systems, D2D communications, Internet of things, NB-IoT, Trustworthiness

Electronic versions:

NB-IoT for D2D-Enhanced Content Uploading with Social Trustworthiness in 5G Systems

DOIs:

10.3390/fi9030031

URLs:

<http://urn.fi/URN:NBN:fi:tty-201708041652>

### Bibliographical note

INT=elt,"Orsino, Antonino"

Source: Scopus

Source ID: 85022204929

Research output: Contribution to journal › Article › Scientific › peer-review

### Natural Gas Engine Emission Reduction by Catalysts

In order to meet stringent emission limits, after-treatment systems are increasingly utilized in natural gas engine applications. In this work, two catalyst systems were studied in order to clarify how the catalysts affect, e.g. hydrocarbons, NOx and particles present in natural gas engine exhaust. A passenger car engine modified to run with natural gas was used in a research facility with possibilities to modify the exhaust gas properties. High NOx reductions were observed when using selective catalytic reduction, although a clear decrease in the NOx reduction was recorded at higher temperatures. The relatively fresh methane oxidation catalyst was found to reach reductions greater than 50% when the exhaust temperature and the catalyst size were sufficient. Both the studied catalyst systems were found to have a significant effect on particulate emissions. The observed particle mass reduction was found to be due to a decrease in the amount of organics passing over the catalyst. However, especially at high exhaust temperatures, high nanoparticle concentrations were observed downstream of the catalysts together with higher sulphate concentrations in particles. This study contributes to understanding emissions from future natural gas engine applications with catalysts in use.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Physics, Research area: Aerosol Physics, Finnish Meteorological Institute, Helsinki, VTT Technical Research Centre of Finland, Atmospheric Composition Research, Finnish Meteorological Institute, Dinex Ecocat Oy, Dinex Ecocat Oy, Catalyst Res

Contributors: Lehtoranta, K., Murtonen, T., Vesala, H., Koponen, P., Alanen, J., Simonen, P., Rönkkö, T., Timonen, H., Saarikoski, S., Maunula, T., Kallinen, K., Korhonen, S.

Number of pages: 10

Pages: 142-152

Publication date: Jun 2017

Peer-reviewed: Yes

Early online date: 23 Dec 2016

### Publication information

Journal: Emission Control Science and Technology

Volume: 3

Issue number: 2

ISSN (Print): 2199-3629

Ratings:

Scopus rating (2017): CiteScore 1.98 SJR 0.731 SNIP 1.435

Original language: English

DOIs:

10.1007/s40825-016-0057-8

Research output: Contribution to journal › Article › Scientific › peer-review

### Influence of the rotor eccentricity on the torque of a cage induction machine

The non-uniform air gap in an electrical machine caused by rotor eccentricity creates an asymmetrical flux-density distribution in the air gap. This can affect the nominal torque produced by the machine. Eccentricity also produces forces that act on the rotor which may also have an effect on the torque. Thus, it is important to know how the torque of the machine behaves. In this paper, the torque of a cage induction machine is studied when the machine has dynamic eccentricity. The study is performed using the finite element method and a magnetic vector potential formulation. The torque is calculated by the method of energy balance. The harmonic components of the torque are also analyzed. The results show that the machine under eccentricity does not exhibit the same torque as a normal healthy machine. The harmonic components around the first principal slot harmonic is most affected.

### General information



Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Electrical Energy Engineering, Research group: Electromechanics, Research area: Power engineering, Aalto University  
Contributors: Silwal, B., Rasilo, P., Belahcen, A., Arkkio, A.  
Pages: 383-396  
Publication date: Jun 2017  
Peer-reviewed: Yes

#### Publication information

Journal: Archives of Electrical Engineering  
Volume: 66  
Issue number: 2  
ISSN (Print): 2300-2506  
Ratings:  
Scopus rating (2017): CiteScore 0.86 SJR 0.233 SNIP 0.65  
Original language: English  
Electronic versions:  
Silwal2017  
DOIs:  
10.1515/ae-2017-0029  
URLs:  
<http://urn.fi/URN:NBN:fi:ty-201708151681>  
Research output: Contribution to journal > Article > Scientific > peer-review

#### Kactus2: A graphical EDA tool built on the IP-XACT standard

##### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Pervasive Computing, Research area: Computer engineering, Research area: Computer engineering  
Contributors: Virtanen, J., Kamppi, A., Pekkarinen, E., Määttä, J., Järvinen, J., Matilainen, L. J., Teuvo, M., Hämäläinen, T.  
Number of pages: 1  
Pages: 1  
Publication date: 2 May 2017  
Peer-reviewed: Yes

##### Publication information

Journal: The Journal of Open Source Software  
Volume: 2  
Issue number: 13  
ISSN (Print): 2475-9066  
Original language: English  
Keywords: IP-XACT, EDA, reuse, mp soc, design, system-on-chip, Hardware  
Electronic versions:  
10.21105/joss.00151  
DOIs:  
10.21105/joss.00151  
URLs:  
<http://urn.fi/URN:NBN:fi:ty-201801051028>

##### Bibliographical note

INT=tie,"Järvinen, Juho"  
Research output: Contribution to journal > Article > Scientific > peer-review

#### Editorial: Information to support decision-making

##### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Civil Engineering  
Contributors: Juuti, P. S.  
Pages: 5-6

Publication date: May 2017

Peer-reviewed: Yes

### Publication information

Journal: Ympäristöhistoria: Finnish Journal of Environmental History

Volume: 2017

Issue number: 1

ISSN (Print): 1799-6953

Original language: English

URLs:

[http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/2017\\_1.html](http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/2017_1.html)

Research output: Contribution to journal › Editorial › Scientific › peer-review

### Alkyl thiophene vinylene electropolymerization in C8mimPF6, potential use in solar cells

We report the electrosynthesis of a novel semiconductor polymer based on alkyl vinylthiophene derivative in the presence of an ionic liquid (IL). The polymerization was performed under galvanostatic conditions and the polymer was studied as potential donor component of a multilayer heterojunction organic solar cell (OSC). The monomer used was (E)-1,2-di-(3-octyl-2-thienyl) vinylene (OTV) and the IL used for the electropolymerization was 1-octyl-3-methylimidazole hexafluorophosphate C8mimPF6. Optical properties, stability and morphology of the polymer were analyzed using FT-IR, UV-vis, Raman and XPS spectroscopy. Voltammetry analysis and scanning electron microscopy (SEM-EDX) were also performed on the polymer. The OSC assembled with the polymer of OTV was used as electro donor and C60 as acceptor. Molybdenum trioxide (MoO<sub>3</sub>) and bathocuproine (BCP) were used as buffer layer between anode and cathode respectively. I-V curves, in the dark and under AM 1.5 solar simulator were performed to measure its efficiency.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Chemistry and Bioengineering, Research group: Supramolecular photochemistry, Research group:

Chemistry & Advanced Materials

Contributors: Rojas, V., Martinez, F., Bernede, J. C., Guenadez, L. C., Efimov, A., Lemmetyinen, H.

Number of pages: 13

Pages: 405-417

Publication date: May 2017

Peer-reviewed: Yes

### Publication information

Journal: Materials Sciences and Applications

Volume: 8

Issue number: 5

ISSN (Print): 2153-117X

Original language: English

Electronic versions:

2017-martinez-MSA

DOIs:

10.4236/msa.2017.85013

URLs:

<http://urn.fi/URN:NBN:fi:tty-201706151598>

Research output: Contribution to journal › Article › Scientific › peer-review

### Collagen-immobilized polyimide membranes for retinal pigment epithelial cell adherence and proliferation

Degenerative retinal diseases are a leading cause of visual loss and irreversible blindness, particularly in the developed world. Retinal pigment cell (RPE) transplantation is nowadays considered the most promising therapeutic approach for certain retinal diseases, and the presence of a supportive scaffold has been considered essential to ensure the success of the implant. In this work, collagen IV was covalently immobilized to the surface of polyimide membranes, with the purpose of developing scaffold materials for RPE cell culture. The covalent modification method involved four steps: argon-plasma treatment, acrylic acid graft polymerization, surface activation, and finally immobilization of collagen type IV. Collagen-modified membranes did not become more rough but became significantly more hydrophilic than the unmodified and dip-coated controls. ARPE-19 cell morphology and attachment were studied by immunofluorescence staining and confocal microscopy. Covalently modified surfaces showed cell attachment and cell properties comparable to the uncoated and dip-coated controls. This work demonstrated the potential of collagen IV-immobilized polyimide membranes as substrates for the growth of ARPE-19 cells.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Biomaterials and Tissue Engineering Group, BioMediTech, University of Tampere, BioMediTech

Contributors: Teymouri, S., Calejo, M. T., Hiltunen, M., Sorkio, A. E., Juuti-Uusitalo, K., Skottman, H., Kellomäki, M.

Publication date: 6 Mar 2017

Peer-reviewed: Yes

### Publication information

Journal: Cogent Chemistry

Volume: 3

Issue number: 1

ISSN (Print): 2331-2009

Original language: English

Keywords: Polyimide, Retinal pigment epithelial cell, SURFACE MODIFICATION, tissue engineering

Electronic versions:

Collagen immobilized polyimide membranes for retinal pigment epithelial cell adherence and proliferation

DOIs:

10.1080/23312009.2017.1292593

URLs:

<http://urn.fi/URN:NBN:fi:tyy-201703231218>

Research output: Contribution to journal > Article > Scientific > peer-review

### Reaction heat utilization in aluminosilicate-based ceramics synthesis and sintering

Self-propagating high-temperature synthesis (SHS) is a widely known and extensively studied highly exothermic reaction-utilizing technique for making certain advanced composites and intermetallic compounds. However, only few studies have been published about the SHS of pure aluminosilicate ceramics. In the current work, possibilities for aluminosilicate ceramic synthesis and sintering requiring less energy based on the utilization of SHS in air was studied. Kaolinite powder and exothermically reactive metallic aluminium powder were used as raw materials. Thermodynamic calculations for the possible reactions and reaction paths were performed to show the theoretical possibilities for SHS utilization. The chemical reactions, thermal expansion behaviour and formed phase- and microstructures after SHS were compared to the conventional reaction sintering of mullite. Results conclude that highly exothermic reactions above 900 °C relating mainly to aluminium oxidation can ignite the SHS reaction in air atmosphere. After initialization, the reaction proceeded in a self-sustaining manner through entire test pieces, resulting in the formation of an Al<sub>2</sub>O<sub>3</sub> - Si phase structure. Thermodynamic calculations showed the total energy balance for mullite formation from aluminium and kaolinite mixtures as highly exothermic in nature only if sufficient oxygen is available to complete the reactions. However, future research is needed to fully utilize SHS in aluminosilicate ceramics processing.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Materials Science, Research group: Ceramic materials, VTT Technical Research Centre of Finland

Contributors: Karhu, M., Lagerbom, J., Kivikytö-Reponen, P., Ismailov, A., Levänen, E.

Number of pages: 12

Pages: 101-112

Publication date: 1 Mar 2017

Peer-reviewed: Yes

### Publication information

Journal: Journal of Ceramic Science and Technology

Volume: 8

Issue number: 1

ISSN (Print): 2190-9385

Ratings:

Scopus rating (2017): CiteScore 1.4 SJR 0.374 SNIP 0.801

Original language: English

ASJC Scopus subject areas: Ceramics and Composites

Keywords: Aluminosilicate ceramics, Exothermic reactions, Self-propagating high-temperature synthesis, SHS, Sintering, Synthesis

DOIs:

10.4416/JCST2016-00094

### Bibliographical note

EXT="Lagerbom, J."

Source: Scopus

Source ID: 85017026033

### Effect of Laser Power on Yield of TiO<sub>2</sub> Nanoparticles Synthesized by Pulsed Laser Ablation in Water

In this study, the pulsed laser ablation in liquids (PLAL) technique was used on titanium in deionized water at different laser powers to understand its effect on the synthesis yield of nanoparticles. A 500-ns 1062-nm fiber laser at 25 kHz was used to effect PLAL of titanium to produce nanoparticles. TEM images of the synthesized nanoparticles showed spherical particles ranging from 32 nm in diameter. The electron diffraction pattern and high peaks in the wide-angle x-ray scattering (WAXS) pattern indicated high crystallinity of nanoparticles. WAXS results showed nanoparticles were allotropes of titania: rutile and anatase. Synthesis yield measurements indicated an increase in yield with the increase in laser power as long as the increase in laser fluence remains proportional to the increase in laser power. However, the yield increased proportionally with the increase in laser fluence. The analysis of the chosen laser pulse duration and repetition rate showed an increase in the yield with longer pulse duration and higher repetition rate.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Materials Science, Research group: Ceramic materials, Mechanical Engineering and Industrial Systems, Research area: Manufacturing and Automation, Research group: Surface Engineering, Research group: Materials Characterization, Research group: Ceramic materials

Contributors: Singh, A., Vihinen, J., Frankberg, E., Hyvärinen, L., Honkanen, M., Levänen, E.

Number of pages: 5

Pages: 39-43

Publication date: Mar 2017

Peer-reviewed: Yes

#### Publication information

Journal: Journal of Ceramic Science and Technology

Volume: 8

Issue number: 1

ISSN (Print): 2190-9385

Ratings:

Scopus rating (2017): CiteScore 1.4 SJR 0.374 SNIP 0.801

Original language: English

Keywords: Nanoparticles, synthesis yield, pulsed laser ablation in liquids, WAXS, laser fluence, WAVELENGTH, GOLD

Electronic versions:

10.4416\_JCST2016-00071-1

DOIs:

10.4416/JCST2016-00071

URLs:

<http://urn.fi/URN:NBN:fi:tuni-201910183944>

Source: WOS

Source ID: 000397702900008

Research output: Contribution to journal › Article › Scientific › peer-review

### Evolutionary multiobjective optimization for adaptive dataflow-based digital predistortion architectures

In wireless communication systems, high-power transmitters suffer from nonlinearities due to power amplifier (PA) characteristics, I/Q imbalance, and local oscillator (LO) leakage. Digital Predistortion (DPD) is an effective technique to counteract these impairments. To help maximize agility in cognitive radio systems, it is important to investigate dynamically reconfigurable DPD systems that are adaptive to changes in the employed modulation schemes and operational constraints. To help maximize effectiveness, such reconfiguration should be performed based on multidimensional operational criteria. With this motivation, we develop in this paper a novel evolutionary algorithm framework for multiobjective optimization of DPD systems. We demonstrate our framework by applying it to develop an adaptive DPD architecture, called the adaptive, dataflow-based DPD architecture (ADDA), where Pareto-optimized DPD parameters are derived subject to multidimensional constraints to support efficient predistortion across time-varying operational requirements and modulation schemes. Through extensive simulation results, we demonstrate the effectiveness of our proposed multiobjective optimization framework in deriving efficient DPD configurations for run-time adaptation.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Pervasive Computing, Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Research area: Computer engineering, University of Oulu

Contributors: Li, L., Ghazi, A., Boutellier, J., Anttila, L., Valkama, M., Bhattacharyya, S. S.

Publication date: 23 Feb 2017

Peer-reviewed: Yes

#### Publication information

Journal: EAI Endorsed Transactions on Cognitive Communications

Volume: 17

Issue number: 10

Article number: e3

ISSN (Print): 2313-4534

Original language: English

Electronic versions:

[eai.23-2-2017.152187-1](https://doi.org/10.4108/eai.23-2-2017.152187-1)

DOIs:

[10.4108/eai.23-2-2017.152187](https://doi.org/10.4108/eai.23-2-2017.152187)

URLs:

<http://urn.fi/URN:NBN:fi:tyy-201907151962>

Research output: Contribution to journal > Article > Scientific > peer-review

### Suomen vesihuollon kehitys ja opit kansainvälisessä kontekstissa

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Civil Engineering

Contributors: Katko, T. S.

Number of pages: 4

Pages: 8-11

Publication date: 2017

Peer-reviewed: Yes

#### Publication information

Journal: Vesitalous

Volume: 58

Issue number: 1

ISSN (Print): 0505-3838

Original language: Finnish

URLs:

<http://www.vesitalous.fi/vesitalous-lehdet/vesien-historia/>

Research output: Contribution to journal > Article > Scientific > peer-review

### Three-color vector nematicon

Light localization via reorientation in nematic liquid crystals supports multi-component optical spatial solitons, i.e., vector nematicons. By launching three optical beams of different wavelengths and the same input polarization in a bias-free planar cell, we demonstrate a three-color vector nematicon which is self-trapped thanks to its incoherent nature.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Photonics, Politechnika Warszawska, Univ Roma Tre, Roma Tre University, Dept Elect Engn, NooEL, University "Roma Tre", Aerosol Physics Laboratory

Contributors: Laudyn, U. A., Kwaśny, M., Karpierz, M. A., Assanto, G.

Number of pages: 3

Pages: 36-38

Publication date: 2017

Peer-reviewed: Yes

#### Publication information

Journal: Photonics Letters of Poland

Volume: 9

Issue number: 2

ISSN (Print): 2080-2242

Ratings:

Scopus rating (2017): CiteScore 0.48 SJR 0.25 SNIP 0.36

Original language: English  
ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials  
Electronic versions:  
718-2839-1-PB  
DOIs:  
10.4302/plp.v9i2.718  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201708071660>  
Source: Scopus  
Source ID: 85021814168  
Research output: Contribution to journal › Article › Scientific › peer-review

### **Manipulating Superparamagnetic Microparticles with an Electromagnetic Needle**

Selective, precise, and high-throughput manipulation of individual superparamagnetic microparticles has profound applications in performing location-tailored in vitro biomedical studies. The current techniques for manipulation of microparticles allow only a single particle in the manipulation workspace, or simultaneous transportation of multiple microparticles in batches. In this work, a method based on a robotized electromagnetic needle for manipulation of individual superparamagnetic microparticles within a microparticle population is introduced. By automatically controlling the highly localized magnetic field of the needle, a single microparticle is selectively picked when its neighboring particle is few micrometers away. Supported by the nanometer resolution of the robotic positioner, particles are placed at sub-micrometer precision. This manipulation technique allows the creating of arbitrary patterns, sorting of microparticles based on size and morphology, and transporting of individual microparticles in 3D space. Therefore, this approach has the potential to enable more deterministic and quantitative microanalysis and microsynthesis using superparamagnetic microparticles.

#### **General information**

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Micro and Nanosystems Research Group, Research group: Bioinspired Materials and Robotics (BMR)  
Contributors: Cenev, Z., Zhang, H., Sariola, V., Rahikkala, A., Liu, D., Santos, H. A., Zhou, Q.  
Publication date: 2017  
Peer-reviewed: Yes

#### **Publication information**

Journal: Advanced Materials Technologies  
Volume: 3  
Issue number: 1  
Article number: 1700177  
ISSN (Print): 2365-709X  
Ratings:  
Scopus rating (2017): CiteScore 3.85 SJR 1.241 SNIP 0.99  
Original language: English  
Electronic versions:  
admt201700177  
DOIs:  
10.1002/admt.201700177  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201712212482>  
Research output: Contribution to journal › Article › Scientific › peer-review

### **Securing the flow of information in renovation projects: Sustainable synergies from buildings to the urban scale**

Continuous flow of information is a paramount importance for the success of a renovation project. This has been a clear statement in several researches, clearances, publications and press releases in Finland. Tampere University of Technology (TUT) studied Finnish state supported mold renovations in three independent researches between 2010 and 2016. First one brought out that the observations made in the condition investigation weren't always taken into account in the implementation of the renovation. Next two researches focused to study the additional state grant processes, where the external review procedures were helping the flow of information. However, the processes still had some shortcomings and therefore the research team developed a form based method that property owners and builders can utilize for a successful removal of the indoor air problems. This paper describes the outlines of the form as well as the principles and methods for securing the flow of information from condition investigations to the renovation design and quality assurance of the building project. Project planning and monitoring measurements are also taken into account in the method.

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Civil Engineering, Research area: Structural Engineering  
Contributors: Marttila, T., Annala, P., Suonketo, J., Kero, P., Pentti, M.  
Number of pages: 6  
Pages: 228-233  
Publication date: 2017  
Peer-reviewed: Yes

### Publication information

Journal: PROCEEDIA ENVIRONMENTAL SCIENCES  
Volume: 38  
ISSN (Print): 1878-0296  
Original language: English  
Keywords: Moisture damage, Indoor air quality (IAQ), Condition investigation, Renovation design  
DOIs:  
10.1016/j.proenv.2017.03.109  
Source: RIS  
Source ID: urn:1E04A8F47620BCE57737681F0930D8DB  
Research output: Contribution to journal › Article › Scientific › peer-review

### Teoriaa ja kokemuksia arvioinnista MOOCien aikakaudella

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Information Management and Logistics, Research group: Novi, Tampere University of Applied Sciences  
Contributors: Helander, N., Myllylä, M.  
Number of pages: 7  
Pages: 70-77  
Publication date: 11 Jul 2016  
Peer-reviewed: Yes

#### Publication information

Journal: TAMPEREEN AMMATTIKORKEAKOULUN JULKAISUJA. SARJA B, RAPORTTEJA  
ISSN (Print): 1456-002X  
Original language: Finnish  
URLs:  
<http://julkaisut.tamk.fi/PDF-tiedostot-web/B/88-Floworks.pdf>  
Research output: Contribution to journal › Article › Scientific › peer-review

### Image-based characterization of the pulp flows

Material flow characterization is important in the process industries and its further automation. In this study, close-to-laminar pulp suspension flows are analyzed based on double-exposure images captured in laboratory conditions. The correlation-based methods including autocorrelation and the particle image pattern technique were studied. During the experiments, synthetic and real test data with manual ground truth were used. The particle image pattern matching method showed better performance achieving the accuracy of 90.0% for the real data set with linear motion of the suspension and 79.2% for the data set with flow distortions.

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Signal Processing, Lappeenranta University of Technology, Machine Vision and Pattern Recognition Laboratory, Laboratory of Biosystem Dynamics, Univ of Oulu, Monash University Malaysia  
Contributors: Sorokin, M., Strokina, N., Eerola, T., Lensu, L., Karttunen, K., Kalviainen, H.  
Number of pages: 8  
Pages: 630-637  
Publication date: 1 Jul 2016  
Peer-reviewed: Yes

#### Publication information

Journal: Pattern Recognition and Image Analysis  
Volume: 26

Issue number: 3  
ISSN (Print): 1054-6618  
Ratings:

Scopus rating (2016): CiteScore 0.55 SJR 0.255 SNIP 0.872

Original language: English

ASJC Scopus subject areas: Computer Graphics and Computer-Aided Design, Computer Vision and Pattern Recognition

Keywords: double-exposure, particle image velocimetry, pulp flow estimation

DOIs:

10.1134/S1054661816030196

Source: Scopus

Source ID: 84984924424

Research output: Contribution to journal › Article › Scientific › peer-review

### **Data including GROMACS input files for atomistic molecular dynamics simulations of mixed, asymmetric bilayers including molecular topologies, equilibrated structures, and force field for lipids compatible with OPLS-AA parameters**

In this Data in Brief article we provide a data package of GROMACS input files for atomistic molecular dynamics simulations of multicomponent, asymmetric lipid bilayers using the OPLS-AA force field. These data include 14 model bilayers composed of 8 different lipid molecules. The lipids present in these models are: cholesterol (CHOL), 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphatidylcholine (POPC), 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphatidylethanolamine (POPE), 1-stearoyl-2-oleoyl-sn-glycero-3-phosphatidyl-ethanolamine (SOPE), 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphatidylserine (POPS), 1-stearoyl-2-oleoyl-sn-glycero-3-phosphatidylserine (SOPS), N-palmitoyl-. D-erythro-sphingosyl-phosphatidylcholine (SM16), and N-lignoceroyl-. D-erythro-sphingosyl-phosphatidylcholine (SM24). The bilayers[U+05F3] compositions are based on lipidomic studies of PC-3 prostate cancer cells and exosomes discussed in Llorente et al. (2013) [1], showing an increase in the section of long-tail lipid species (SOPS, SOPE, and SM24) in the exosomes. Former knowledge about lipid asymmetry in cell membranes was accounted for in the models, meaning that the model of the inner leaflet is composed of a mixture of PC, PS, PE, and cholesterol, while the extracellular leaflet is composed of SM, PC and cholesterol discussed in Van Meer et al. (2008) [2]. The provided data include lipids' topologies, equilibrated structures of asymmetric bilayers, all force field parameters, and input files with parameters describing simulation conditions (md.mdp). The data is associated with the research article "Interdigitation of Long-Chain Sphingomyelin Induces Coupling of Membrane Leaflets in a Cholesterol Dependent Manner" (Róg et al., 2016) [3].

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Physics, Research area: Computational Physics, Research group: Biological Physics and Soft Matter, University of Helsinki, University of Limerick, University of Oslo, Zora Biosciences Oy, MEMPHYS - Centre for Biomembrane Physics, University of Southern Denmark

Contributors: Róg, T., Orłowski, A., Llorente, A., Skotland, T., Sylvänne, T., Kauhanen, D., Ekroos, K., Sandvig, K., Vattulainen, I.

Number of pages: 4

Pages: 1171-1174

Publication date: 1 Jun 2016

Peer-reviewed: Yes

### **Publication information**

Journal: Data in Brief

Volume: 7

ISSN (Print): 2352-3409

Ratings:

Scopus rating (2016): CiteScore 0.5 SJR 0.226 SNIP 0.213

Original language: English

Keywords: Force field, GROMACS, Lipid, Lipidomics, Molecular dynamics simulations, Topology

Electronic versions:

Rog et al. Data including GROMACS

Supplementary material

DOIs:

10.1016/j.dib.2016.03.067

URLs:

<http://urn.fi/URN:NBN:fi:ty-201604283887>

Source: Scopus

Source ID: 84962909567

Research output: Contribution to journal › Article › Scientific › peer-review



## Parameters Affecting the Upcycling of Waste Cotton and PES/CO Textiles

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Materials Science, Research group: Fibre Materials  
Contributors: Vats, S., Rissanen, M.  
Number of pages: 12  
Pages: 166-177  
Publication date: 30 May 2016  
Peer-reviewed: Yes

### Publication information

Journal: Recycling  
Volume: 1  
Issue number: 1  
ISSN (Print): 2313-4321  
Original language: English  
Electronic versions:  
recycling-01-00166  
DOIs:  
10.3390/recycling1010166  
URLs:  
<http://urn.fi/URN:NBN:fi:ty-201605304201>  
Research output: Contribution to journal › Article › Scientific › peer-review

## Architecture beyond signs and symbols : Zumthor's response to the problems of aesthetics

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: School of Architecture, Research group: History of Architecture  
Contributors: Passinmäki, P.  
Number of pages: 4  
Pages: 325-328  
Publication date: 12 May 2016  
Peer-reviewed: Yes

### Publication information

Journal: ARQ-Architectural Research Quarterly  
Volume: 19  
Issue number: 4  
ISSN (Print): 1359-1355  
Ratings:  
Scopus rating (2016): CiteScore 0.06 SJR 0.127 SNIP 0.244  
Original language: English  
DOIs:  
10.1017/S1359135516000038  
Research output: Contribution to journal › Article › Scientific › peer-review

## Adaptive fuzzy inference system based directional median filter for impulse noise removal

Noise filtering in presence of important image detail information is considered as challenging task in imaging applications. Use of fuzzy logic based techniques is capturing more focus since last decade to deal with these challenges. In order to tackle conflicting issues of noise smoothing and detail preservation, this paper presents a novel approach using adaptive fuzzy inference system for random valued impulse noise detection and removal. The proposed filter uses the intensity based directional statistics to construct adaptive fuzzy membership functions which plays an important role in fuzzy inference system. Fuzzy inference system constructed in this way is used by the noise detector for accurate classification of noisy and noise-free pixels by differentiating them from edges and detailed information present in an image. After classification of pixels, noise adaptive filtering is performed based on median and directional median filter using the information provided by the noise detector. Simulation results based on well known quantitative measure i.e., peak-signal-to-noise ratio (PSNR) show the effectiveness of proposed filter.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Electronics and Communications Engineering, International Islamic University Islamabad

Contributors: Habib, M., Hussain, A., Rasheed, S., Ali, M.

Number of pages: 9

Pages: 689-697

Publication date: 1 May 2016

Peer-reviewed: Yes

### Publication information

Journal: AEU International Journal of Electronics and Communication

Volume: 70

Issue number: 5

ISSN (Print): 1434-8411

Ratings:

Scopus rating (2016): CiteScore 1.49 SJR 0.32 SNIP 0.964

Original language: English

ASJC Scopus subject areas: Electrical and Electronic Engineering

Keywords: Adaptive threshold, Fuzzy inference system, Noise detection, Noise removal, Random-valued impulse noise

DOIs:

10.1016/j.aeue.2016.02.005

### Bibliographical note

INT=elt,"Ali, Mubashir"

Source: Scopus

Source ID: 84959549053

Research output: Contribution to journal › Article › Scientific › peer-review

### Fully printed memristors for a self-sustainable recorder of mechanical energy

Memristors have attracted significant interest in recent years because of their role as a missing electronic component and unique functionality that has not previously existed. Since the first discoveries of the existence of memristive materials, various different fabrication processes for memristors have been presented. Here, a simple additive fabrication process is demonstrated where memristors were deposited on a polymer substrate by conventional inkjet printing. The memristor structure was printed on a 125  $\mu$  m thick polyethylene terephthalate (PET) substrate by sandwiching a thin layer of TiO<sub>x</sub> between two silver nanoparticle ink electrodes. Current–voltage ( *I*–*V* ) characterization measurements were performed and they showed clear memristive behavior when voltage pulse amplitude varied between –1.5 V and 1.5 V. The corresponding resistance change is approximately between 150  $\Omega$  and 75 k $\Omega$ . In order to demonstrate the switching scheme in practical application, printed memristors and a printed voltage doubler were connected with a piezoelectric element. The element was subjected to impact-type excitation thus producing an electric charge that was able to switch the memristor between high and low resistive states. These results pave the way for an exploitation of cost-efficient, self-sufficient, all-printable memory elements for wide utilization in future electronics applications.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Electronics and Communications Engineering, Department of Automation Science and Engineering, Research area: Microsystems, Research area: Measurement Technology and Process Control

Contributors: Vilmi, P., Nelo, M., Voutilainen, J., Palosaari, J., Pöyhönen, J., Tuukkanen, S., Jantunen, H., Juuti, J., Fabritius, T.

Number of pages: 8

Publication date: 19 Apr 2016

Peer-reviewed: Yes

### Publication information

Journal: Flexible and Printed Electronics

Volume: 1

Issue number: 2

Article number: 025002

ISSN (Print): 2058-8585

Original language: English

Electronic versions:

Vilmi\_2015\_Printed\_memristor\_preprint

DOIs:

10.1088/2058-8585/1/2/025002

URLs:

<http://urn.fi/URN:NBN:fi:ty-201606134229>

Source: Bibtex

Source ID: urn:93364f0c9fc6d11e220f8d004617b3a2

Research output: Contribution to journal > Article > Scientific > peer-review

### Quenching nematicon fluctuations via photo-stabilization

Light localization into optical spatial solitons can be achieved by launching optical beams in nonlocal nonlinear nematic liquid crystals. Such solitons often undergo undesired fluctuations of their trajectories. We demonstrate that partial polymerization in monoacrylate-doped nematic liquid crystals is effective in quenching such fluctuations in transverse space.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Physics, Research area: Optics, Research group: Nonlinear Optics, Department of Chemistry and Bioengineering, Research group: Supramolecular photochemistry

Contributors: Karimi, N., Alberucci, A., Virkki, M., Priimägi, A., Kauranen, M., Assanto, G.

Number of pages: 3

Pages: 2-4

Publication date: 31 Mar 2016

Peer-reviewed: Yes

#### Publication information

Journal: Photonics Letters of Poland

Volume: 8

Issue number: 1

ISSN (Print): 2080-2242

Ratings:

Scopus rating (2016): CiteScore 0.37 SJR 0.197 SNIP 0.272

Original language: English

Electronic versions:

626-2449-1-PB

DOIs:

10.4302/plp.2016.1.02

URLs:

<http://urn.fi/URN:NBN:fi:tty-201604253877>

Research output: Contribution to journal > Letter > Scientific > peer-review

### First-principles data set of 45,892 isolated and cation-coordinated conformers of 20 proteinogenic amino acids

We present a structural data set of the 20 proteinogenic amino acids and their amino-methylated and acetylated (capped) dipeptides. Different protonation states of the backbone (uncharged and zwitterionic) were considered for the amino acids as well as varied side chain protonation states. Furthermore, we studied amino acids and dipeptides in complex with divalent cations ( $\text{Ca}^{2+}$ ,  $\text{Ba}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Pb}^{2+}$ , and  $\text{Hg}^{2+}$ ). The database covers the conformational hierarchies of 280 systems in a wide relative energy range of up to 4 eV (390 kJ/mol), summing up to a total of 45,892 stationary points on the respective potential-energy surfaces. All systems were calculated on equal first-principles footing, applying density-functional theory in the generalized gradient approximation corrected for long-range van der Waals interactions. We show good agreement to available experimental data for gas-phase ion affinities. Our curated data can be utilized, for example, for a wide comparison across chemical space of the building blocks of life, for the parametrization of protein force fields, and for the calculation of reference spectra for biophysical applications.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Physics, Fritz Haber Institute of the Max Planck Society, COMP Centre of Excellence, Department of Applied Physics, Aalto University, Aalto University, Duke University

Contributors: Ropo, M., Schneider, M., Baldauf, C., Blum, V.

Publication date: 16 Feb 2016

Peer-reviewed: Yes

#### Publication information

Journal: Scientific Data

Volume: 3

Article number: 160009

ISSN (Print): 2052-4463

Ratings:

Scopus rating (2016): CiteScore 4.8 SJR 3.261 SNIP 2.124

Original language: English

ASJC Scopus subject areas: Education, Library and Information Sciences, Computer Science Applications, Information Systems, Statistics, Probability and Uncertainty, Statistics and Probability

Electronic versions:

ropo et al - First-principles data set

DOIs:

[10.1038/sdata.2016.9](https://doi.org/10.1038/sdata.2016.9)

URLs:

<http://urn.fi/URN:NBN:fi:tty-201607294339>

Source: Scopus

Source ID: 84961184519

Research output: Contribution to journal › Article › Scientific › peer-review

### **Linear and nonlinear light beam propagation in chiral nematic liquid crystal waveguides**

We employ a thick layer of chiral nematic liquid crystals to demonstrate the evolution of a one-dimensional (1D) higher-order guided mode into a beam self-confined in both transverse dimensions at various wavelengths. We also report the experimental observation of higher-order modes guided by soliton-induced waveguides in chiral nematic liquid crystals.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Physics, Politechnika Warszawska, University of Warsaw, Aerosol Physics Laboratory, Nonlinear Optics and OptoElectronics Lab, University "Roma Tre"

Contributors: Laudyn, U. A., Kwaśny, M., Jung, P. S., Trippenbach, M., Assanto, G., Karpierz, M. A.

Number of pages: 3

Pages: 11-13

Publication date: 2016

Peer-reviewed: Yes

#### **Publication information**

Journal: Photonics Letters of Poland

Volume: 8

Issue number: 1

ISSN (Print): 2080-2242

Ratings:

Scopus rating (2016): CiteScore 0.37 SJR 0.197 SNIP 0.272

Original language: English

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials

Electronic versions:

Linear and nonlinear light beam propagation in chiral nematic liquid crystal waveguides

DOIs:

[10.4302/plp.2016.1.05](https://doi.org/10.4302/plp.2016.1.05)

URLs:

<http://urn.fi/URN:NBN:fi:tty-201604253878>

Source: Scopus

Source ID: 84962158419

Research output: Contribution to journal › Article › Scientific › peer-review

### **Influence of environmental conditions on EMF levels in a span of overhead transmission lines**

The paper is devoted to the investigation of electromagnetic field distribution in the vicinity of overhead transmission lines under different environmental conditions, taking into account the wire sag curve in a span. A wire state equation is utilized, which allows one to calculate stresses in the wire and sags based on the known stresses and temperatures in the initial state. The results of the electric and magnetic field distribution on sample 330 kV and 110 kV transmission lines are presented. We show that the highest electromagnetic field levels are associated with the most severe environmental conditions, resulting in the highest sag.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Electronics and Communications Engineering, Research group: Environmental Health, LLC Soyuzenergooproekt

Contributors: Okun, O., Kravchenko, Y., Korpinen, L.

Number of pages: 9  
Pages: 163-171  
Publication date: 2016  
Peer-reviewed: Yes

#### Publication information

Journal: Progress in Electromagnetics Research C  
Volume: 63  
ISSN (Print): 1937-8718  
Ratings:  
Scopus rating (2016): CiteScore 0.83 SJR 0.221 SNIP 0.597  
Original language: English  
ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials  
DOIs:  
10.2528/PIERC16021106  
Source: Scopus  
Source ID: 84971219955  
Research output: Contribution to journal › Article › Scientific › peer-review

#### High efficiency dilute nitride solar cells: Simulations meet experiments

Parameter extraction procedure and simulation of dilute nitride solar cells are reported. Using PC1D simulation and fitting to experimental current-voltage and external quantum efficiency data, we retrieve the phenomenological material parameters for GaInNAs solar cells. Based on these, we have constructed a model that can explain the changes in short circuit current and open circuit voltage of n-i-p solar cells subjected to rapid thermal annealing. The model reveals that non-annealed MBE-grown GaInNAs material has an n-type doping that evolves to p-type upon rapid thermal annealing. The change of doping type and the shift of the physical location of the pn-junction were confirmed by Kelvin-probe force microscopy. The PC1D modelling was found to work well also for GaInNAs p-i-n solar cells with opposite polarity. It was also found that the GaInNAs lower doping levels in p-i-n solar cells grown at lowered As/III flux ratios were associated with increased carrier lifetimes.

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications  
Contributors: Tukiainen, A., Aho, A., Polojärvi, V., Ahorinta, R., Guina, M.  
Number of pages: 20  
Pages: 113-132  
Publication date: 2016  
Peer-reviewed: Yes

#### Publication information

Journal: Journal of Green Engineering  
Volume: 5  
Issue number: 3-4  
Article number: 8  
ISSN (Print): 1904-4720  
Ratings:  
Scopus rating (2016): CiteScore 0.36 SJR 0.132 SNIP 0.294  
Original language: English  
ASJC Scopus subject areas: Environmental Engineering, Energy(all), Physics and Astronomy(all), Materials Science(all)  
DOIs:  
10.13052/jge1904-4720.5348  
URLs:  
<http://www.scopus.com/inward/record.url?scp=84983050025&partnerID=8YFLogxK> (Link to publication in Scopus)  
Source: Scopus  
Source ID: 84983050025  
Research output: Contribution to journal › Article › Scientific › peer-review

#### Target tracking via combination of particle filter and optimisation techniques

Particle filters (PFs) have been used for the nonlinear estimation for a number of years. However, they suffer from the impoverishment phenomenon. It is brought by resampling which intends to prevent particle degradation, and therefore becomes the inherent weakness of this technique. To solve the problem of sample impoverishment and to improve the performance of the standard particle filter we propose a modification to this method by adding a sampling mechanism inspired by optimisation techniques, namely, the pattern search, particle swarm optimisation, differential evolution and Nelder-Mead algorithms. In the proposed methods, the true state of the target can be better expressed by the optimised

particle set and the number of meaningful particles can be grown significantly. The efficiency of the proposed particle filters is supported by a truck-trailer problem. Simulations show that the hybridised particle filter with Nelder-Mead search is better than other optimisation approaches in terms of particle diversity.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Signal Processing, University of Toledo, Bowling Green State University

Contributors: Hosseini, S. S. S., Jamali, M. M., Astola, J., Gorsevski, P. V.

Number of pages: 18

Pages: 212-229

Publication date: 2016

Peer-reviewed: Yes

#### Publication information

Journal: International Journal of Mathematical Modelling and Numerical Optimization

Volume: 7

Issue number: 2

ISSN (Print): 2040-3607

Ratings:

Scopus rating (2016): CiteScore 1.44 SJR 0.351 SNIP 0.935

Original language: English

ASJC Scopus subject areas: Numerical Analysis, Modelling and Simulation, Applied Mathematics

Keywords: Differential evolution, Nelder-Mead, Particle filter, Particle swarm optimisation, Pattern search, PSO, Target tracking

DOIs:

10.1504/IJMMNO.2016.077068

Source: Scopus

Source ID: 84990239582

Research output: Contribution to journal > Article > Scientific > peer-review

#### Surrogate modeling for initial rotational stiffness of welded tubular joints

Recently, buildings and structures erected in Russia and abroad have to comply with stringent economic requirements. Buildings should not only be reliable and safe, have a beautiful architectural design, but also meet the criteria of rationality and energy efficiency. In practice, this usually means the need for additional comparative analysis in order to determine the optimal solution to the engineering task. Usually such an analysis is time-consuming and requires huge computational efforts. In this regard, surrogate modeling can be an effective tool for solving such problems. This article provides a brief description of surrogate models and the basic techniques of their construction, describes the construction process of a surrogate model to calculate initial rotational stiffness of welded RHS joints made of high strength steel (HSS).

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Civil Engineering, Research group: Metal and Light-wight structures, Peter the Great St. Petersburg Polytechnic University, Peter Great St Petersburg Polytech Univ

Contributors: Garifullin, M. R., Barabash, A. V., Naumova, E. A., Zhuvak, O. V., Jokinen, T., Heinisuo, M.

Number of pages: 24

Pages: 53-76

Publication date: 2016

Peer-reviewed: Yes

#### Publication information

Journal: Magazine of Civil Engineering

Volume: 63

Issue number: 3

ISSN (Print): 2071-4726

Ratings:

Scopus rating (2016): CiteScore 0.3 SJR 0.236 SNIP 0.755

Original language: English

ASJC Scopus subject areas: Civil and Structural Engineering

Keywords: Finite element analysis, Kriging, Plane bending, Square hollow section, Surrogate modeling

Electronic versions:

Surrogate modeling for initial rotational stiffness of welded tubular joints

DOIs:

10.5862/MCE.63.4

URLs:

<http://urn.fi/URN:NBN:fi:tty-201611284820>

URLs:

<http://www.scopus.com/inward/record.url?scp=84994045052&partnerID=8YFLogxK> (Link to publication in Scopus)

#### **Bibliographical note**

EXT="Garifullin, M. R."

Source: Scopus

Source ID: 84994045052

Research output: Contribution to journal › Article › Scientific › peer-review

#### **Preparation and antimicrobial characterization of silver-containing packaging materials for meat**

In food technology, antimicrobial packaging materials could inhibit or limit the growth of spoilage bacteria and thus improve the shelf life of packaged products. The present study provides new insights into the preparation and antimicrobial characterization of silver-containing packaging materials and their efficacy against typical meat spoilage bacteria. Antimicrobial efficacy of packaging films produced by coextrusion or liquid flame spray process was determined by bioluminescence imaging and conventional antimicrobial assay. Fresh pork sirloin was packaged in selected films and composition of meat microbiota was analyzed by 16S rRNA amplicon sequencing. Shelf life of meat was not affected by any of the silver-containing packaging films, even though meat microbiota mostly consisted of bacteria that were inhibited or retarded in vitro by nanoscale silver coating. This may be due to different release dynamics of silver ions on meat surfaces compared to the circumstances in the antimicrobial assay or interactions between silver and amino acids.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Materials Science, Research group: Paper Converting and Packaging, Department of Chemistry and Bioengineering, Engineering materials science and solutions (EMASS), Urban circular bioeconomy (UrCirBio), University of Helsinki, Department of Food Hygiene and Environmental Health

Contributors: Kuuliala, L., Pippuri, T., Hultman, J., Auvinen, S., Kolppo, K., Nieminen, T., Karp, M., Björkroth, J., Kuusipalo, J., Jääskeläinen, E.

Number of pages: 8

Pages: 53-60

Publication date: 1 Dec 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Food Packaging and Shelf Life

Volume: 6

Article number: 67

ISSN (Print): 2214-2894

Ratings:

Scopus rating (2015): CiteScore 2.21 SJR 0.695 SNIP 0.947

Original language: English

ASJC Scopus subject areas: Food Science, Safety, Risk, Reliability and Quality, Biomaterials, Polymers and Plastics, Microbiology (medical)

Keywords: Active packaging, Antimicrobial film, Bioluminescence, Lactic acid bacteria, Liquid flame spray, Silver nanoparticle

DOIs:

10.1016/j.fpsl.2015.09.004

URLs:

<http://www.scopus.com/inward/record.url?scp=84945244937&partnerID=8YFLogxK> (Link to publication in Scopus)

#### **Bibliographical note**

ORG=mol,0.5

ORG=keb,0.5

Source: Scopus

Source ID: 84945244937

Research output: Contribution to journal › Article › Scientific › peer-review

#### **LTCC-Based Multi-Electrode Arrays for 3D in Vitro Cell Cultures**

Current technologies to monitor neuronal cultures in vitro are based on 2-dimensional (2D) multi-electrode arrays and cell cultures. The complexity of actual high-level neurobiological systems requires 3-dimensional (3D) cultures and 3D electrode arrays to improve our understanding of such systems. The realization calls for smart multilayer and packaging technology. Our approach uses low-temperature cofired ceramics (LTCC) for the design of a 3-dimensional multi-electrode array (3D MEA). An LTCC multilayer board with gold electrodes forms the basis of the system. The layout of the 3D MEA

is designed to fit into widely used measurement adapters for 2D signal recordings, enabling data processing identical to that of established chips. Design and manufacturing of the new 3D device as a basic tool for the investigation of 3D cell cultures are described. Features of thick-film gold electrodes are characterized by means of microscopic and spectroscopic tools complemented with complex impedance measurements. Possible biological applications for in vitro electrophysiological measurements were evaluated based on cell cultures of primary neurons, seeded directly to the chip surface. It was shown that activity can be measured over six months.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Electronics and Communications Engineering, Research group: Computational Biophysics and Imaging Group, BioMediTech, Integrated Technologies for Tissue Engineering Research (ITTE), TU Ilmenau, Technische Universität Ilmenau, Inst Mikro & Nanotechnologien MacroNano, ETH, Swiss Federal Institute of Technology Zurich, Inst Biomed Engrn, Lab Biosensors & Bioelect

Contributors: Bartsch, H., Himmerlich, M., Fischer, M., Demko, L., Hyttinen, J., Schober, A.

Number of pages: 10

Pages: 315-324

Publication date: Dec 2015

Peer-reviewed: Yes

#### Publication information

Journal: Journal of Ceramic Science and Technology

Volume: 6

Issue number: 4

ISSN (Print): 2190-9385

Ratings:

Scopus rating (2015): CiteScore 0.53 SJR 0.237 SNIP 0.434

Original language: English

Keywords: Low-temperature cofired ceramics (LTCC), three-dimensional hybrid multi-electrode array (3D MEA), in vitro cell culture, thick-film gold electrode, primary neuron culture, GROWTH

DOIs:

10.4416/JCST2015-00056

Source: WOS

Source ID: 000367422100010

Research output: [Contribution to journal](#) > [Article](#) > [Scientific](#) > [peer-review](#)

#### Time-resolved characterization of primary and secondary particle emissions of a modern gasoline passenger car

Changes in traffic systems and vehicle emission reduction technologies significantly affect traffic-related emissions in urban areas. In many densely populated areas the amount of traffic is increasing, keeping the emission level high or even increasing. To understand the health effects of traffic related emissions, both primary and secondary particles that are formed in the atmosphere from gaseous exhaust emissions need to be characterized. In this study we used a comprehensive set of measurements to characterize both primary and secondary particulate emissions of a modern gasoline passenger car. Our aerosol particle study covers the whole process chain in emission formation, from the engine to the atmosphere, and takes into account also differences in driving patterns. We observed that in mass terms, the amount of secondary particles was 13 times higher than the amount of primary particles. The formation, composition, number, and mass of secondary particles was significantly affected by driving patterns and engine conditions. The highest gaseous and particulate emissions were observed at the beginning of the test cycle when the performance of the engine and the catalyst was below optimal. The key parameter for secondary particle formation was the amount of gaseous hydrocarbons in primary emissions; however, also the primary particle population had an influence. Thus, in order to enhance human health and wellbeing in urban areas, our study strongly indicates that in future legislation, special attention should be directed into the reduction of gaseous hydrocarbons.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Physics, Research area: Aerosol Physics, Finnish Meteorological Institute, Helsinki, VTT Technical Research Centre of Finland, Pennsylvania State University, Atmospheric Composition Research, Finnish Meteorological Institute

Contributors: Karjalainen, P., Timonen, H., Saukko, E., Kuuluvainen, H., Saarikoski, S., Aakko-Saksa, P., Murtonen, T., Dal Maso, M., Ahlberg, E., Svenningsson, B., Brune, W. H., Hillamo, R., Keskinen, J., Rönkkö, T.

Number of pages: 29

Pages: 33253-33282

Publication date: 25 Nov 2015

Peer-reviewed: Yes



### Publication information

Journal: Atmospheric Chemistry and Physics Discussions

Volume: 15

Issue number: 22

ISSN (Print): 1680-7367

Ratings:

Scopus rating (2015): SNIP 0.101

Original language: English

DOIs:

10.5194/acpd-15-33253-2015

URLs:

<http://www.atmos-chem-phys-discuss.net/15/33253/2015/>

Research output: Contribution to journal > Article > Scientific > peer-review

### SimpleTree: An Efficient Open Source Tool to Build Tree Models from TLS Clouds

An open source tool named SimpleTree, capable of modelling highly accurate cylindrical tree models from terrestrial laser scan point clouds, is presented and evaluated. All important functionalities, accessible in the software via buttons and dialogues, are described including the explanation of all necessary input parameters. The method is validated utilizing 101 point clouds of six different tree species, in the main evergreen and coniferous trees. All scanned trees have been destructively harvested to get accurate estimates of above ground biomass with which we assess the accuracy of the SimpleTree-reconstructed cylinder models. The trees were grouped into four data sets and for each one a Concordance Correlation Coefficient of at least 0.92 (0.92, 0.97, 0.92, 0.94) and an total relative error at most ~8 % (2.42%, 3.59%, -4.59%, 8.27%) was achieved in the comparison of the model results to the ground truth data. A global statistical improvement of derived cylinder radii is presented as well as an efficient optimization approach to automatically improve user given input parameters. An additional check of the SimpleTree results is presented via comparison to the results of trees reconstructed using an alternative, published method.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Mathematics, Research group: MAT Inverse Problems, Mathematical modelling with wide societal impact (MathImpact)

Contributors: Hackenberg, J., Spiecker, H., Calders, K., Disney, M., Raunonen, P.

Number of pages: 50

Pages: 4245-4294

Publication date: 23 Nov 2015

Peer-reviewed: Yes

### Publication information

Journal: Forests: Open Access Journal

Volume: 6

Issue number: 11

ISSN (Print): 1999-4907

Ratings:

Scopus rating (2015): CiteScore 1.76 SJR 0.633 SNIP 0.761

Original language: English

DOIs:

10.3390/f6114245

URLs:

<http://www.mdpi.com/1999-4907/6/11/4245> (Webpage of the article)

Research output: Contribution to journal > Article > Scientific > peer-review

### Energy Retrofits in Multi-family Buildings in North-east Europe: The Impacts on Thermal Conditions

We have conducted a project to develop a common protocol for indoor environmental quality (IEQ) assessment and to assess the effects of energy retrofits on IEQ. This paper focuses on thermal comfort, which was first assessed based on 2-month continuous monitoring in 16 multi-family buildings (94 apartments) in Finland and 20 buildings (96 apartments) in Lithuania during heating season before retrofits. In addition, corresponding data after retrofits were available from three buildings (17 apartments) from Finland and seven (30 apartments) from Lithuania. Two data loggers per apartment were placed to evaluate  $T_w$  and RH<sub>w</sub> (warm area), and  $T_c$  and RH<sub>c</sub> (coldest spot). Questionnaire data regarding housing quality and health were collected from the occupants. The results before retrofits indicated high  $T_w$  (>23 °C) for a large proportion of time in Finnish apartments, whereas opposite trend was observed in Lithuania. After retrofits, proportion of time with high  $T_w$  was higher while proportion of apartments with low RH<sub>w</sub> was lower in Finland, whereas in Lithuania, about one fourth of the apartments had higher  $T_w$  and RH<sub>w</sub>, hence fulfilling the national guidelines. The average absolute humidity was higher after retrofits in both countries, especially in Lithuania (by 15%). Occupant responses indicated

improved thermal comfort. Therefore, potential effects of energy retrofits on occupants' thermal environment and satisfaction were demonstrated, and simply adjusting indoor temperature could help to save energy. Further analysis is needed to include the effects of outdoor conditions, as well as overall IEQ to the assessment.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Life Cycle Effectiveness of the Built Environment (LCE@BE), Research group: Concrete and Bridge Structures, Research area: Structural Engineering, Department of Civil Engineering, Research group: Building Physics, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Hlth Protect, Kaunas Univ Technol, Kaunas University of Technology, Dept Environm Technol

Contributors: Du, L., Leivo, V., Prasauskas, T., Turunen, M., Kiviste, M., Martuzevicius, D., Haverinen-Shaughnessy, U.

Number of pages: 5

Pages: 860-864

Publication date: Nov 2015

Peer-reviewed: Yes

#### Publication information

Journal: Energy Procedia

Volume: 78

ISSN (Print): 1876-6102

Ratings:

Scopus rating (2015): CiteScore 0.92 SJR 0.359 SNIP 0.562

Original language: English

Keywords: retrofits;

Electronic versions:

Energy Retrofits in Multi-family Buildings in North-east Europe

DOIs:

10.1016/j.egypro.2015.11.008

URLs:

<http://urn.fi/URN:NBN:fi:tty-201605023901>

Research output: Contribution to journal > Article > Scientific > peer-review

#### Building new computational models to support health behavior change and maintenance: new opportunities in behavioral research

Adverse and suboptimal health behaviors and habits are responsible for approximately 40 % of preventable deaths, in addition to their unfavorable effects on quality of life and economics. Our current understanding of human behavior is largely based on static "snapshots" of human behavior, rather than ongoing, dynamic feedback loops of behavior in response to ever-changing biological, social, personal, and environmental states. This paper first discusses how new technologies (i.e., mobile sensors, smartphones, ubiquitous computing, and cloud-enabled processing/computing) and emerging systems modeling techniques enable the development of new, dynamic, and empirical models of human behavior that could facilitate just-in-time adaptive, scalable interventions. The paper then describes concrete steps to the creation of robust dynamic mathematical models of behavior including: (1) establishing "gold standard" measures, (2) the creation of a behavioral ontology for shared language and understanding tools that both enable dynamic theorizing across disciplines, (3) the development of data sharing resources, and (4) facilitating improved sharing of mathematical models and tools to support rapid aggregation of the models. We conclude with the discussion of what might be incorporated into a "knowledge commons," which could help to bring together these disparate activities into a unified system and structure for organizing knowledge about behavior.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Signal Processing, Research group: Personal Health Informatics-PHI, Research Community on Data-to-Decision (D2D), University of Southern California, Arizona State University, Northeastern University, National Institutes of Health, Bethesda, Northwestern University, Wharton School, University of Pennsylvania, Scientific Institute Hospital San Raffaele, Valencia Polytechnical University, Columbia University in the City of New York, VTT Technical Research Centre of Finland

Contributors: Spruijt-Metz, D., Hekler, E., Saranummi, N., Intille, S., Korhonen, I., Nilsen, W., Rivera, D. E., Spring, B., Michie, S., Asch, D. A., Sanna, A., Salcedo, V. T., Kukakfa, R., Pavel, M.

Number of pages: 12

Pages: 335-346

Publication date: 17 Sep 2015

Peer-reviewed: Yes

#### Publication information

Journal: Translational Behavioral Medicine

Volume: 5

Issue number: 3

ISSN (Print): 1869-6716

Ratings:

Scopus rating (2015): CiteScore 1.63 SJR 0.754 SNIP 0.838

Original language: English

ASJC Scopus subject areas: Behavioral Neuroscience, Applied Psychology

Keywords: Computational models of behavior, Connected health, Health-related behavior, Just-in-time adaptive interventions, mHealth, Mobile health, Real-time interventions

DOIs:

10.1007/s13142-015-0324-1

#### **Bibliographical note**

EXT="Saranummi, Niilo"

Source: Scopus

Source ID: 84939204163

Research output: Contribution to journal > Article > Scientific > peer-review

#### **Effects of subsampling on characteristics of RNA-seq data from triple-negative breast cancer patients**

Background: Data from RNA-seq experiments provide a wealth of information about the transcriptome of an organism. However, the analysis of such data is very demanding. In this study, we aimed to establish robust analysis procedures that can be used in clinical practice. Methods: We studied RNA-seq data from triple-negative breast cancer patients. Specifically, we investigated the subsampling of RNA-seq data. Results: The main results of our investigations are as follows: (1) the subsampling of RNA-seq data gave biologically realistic simulations of sequencing experiments with smaller sequencing depth but not direct scaling of count matrices; (2) the saturation of results required an average sequencing depth larger than 32 million reads and an individual sequencing depth larger than 46 million reads; and (3) for an abrogated feature selection, higher moments of the distribution of all expressed genes had a higher sensitivity for signal detection than the corresponding mean values. Conclusions: Our results reveal important characteristics of RNA-seq data that must be understood before one can apply such an approach to translational medicine.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Signal Processing, Queen's University, Belfast, Northern Ireland, University of Arkansas for Medical Sciences

Contributors: Stupnikov, A., Glazko, G. V., Emmert-Streib, F.

Publication date: 8 Sep 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Chinese Journal of Cancer

Volume: 34

Issue number: 10

ISSN (Print): 1944-446X

Ratings:

Scopus rating (2015): CiteScore 2.63 SJR 1.081

Original language: English

ASJC Scopus subject areas: Oncology

Keywords: Computational genomics, High-dimensional biology, RNA-seq data, Statistical robustness, Triple-negative breast cancer

DOIs:

10.1186/s40880-015-0040-8

Source: Scopus

Source ID: 84944199836

Research output: Contribution to journal > Article > Scientific > peer-review

#### **Towards a Classification Schema for Development Technologies: an Empirical Study in the Avionic Domain**

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: University of Kaiserslautern, Free University of Bozen-Bolzano, Free University of Bolzano-Bozen, Liebherr-Aerospace

Contributors: Taibi, D., Lenarduzzi, V., Dieudonne, L., Plociennik, C.  
Number of pages: 11  
Pages: 125-135  
Publication date: 1 Aug 2015  
Peer-reviewed: Yes

#### Publication information

Journal: INTERNATIONAL JOURNAL ON ADVANCES IN SOFTWARE  
Volume: 8  
Issue number: 1&2  
ISSN (Print): 1942-2628  
Original language: English  
Electronic versions:  
Towards a Classification Schema for Development Technologies and an Empirical Study in the Avionic Domain  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201802091204>  
Research output: Contribution to journal › Article › Scientific › peer-review

#### The effects of neuron morphology on graph theoretic measures of network connectivity: The analysis of a two-level statistical model

We developed a two-level statistical model that addresses the question of how properties of neurite morphology shape the large-scale network connectivity. We adopted a low-dimensional statistical description of neurites. From the neurite model description we derived the expected number of synapses, node degree, and the effective radius, the maximal distance between two neurons expected to form at least one synapse. We related these quantities to the network connectivity described using standard measures from graph theory, such as motif counts, clustering coefficient, minimal path length, and small-world coefficient. These measures are used in a neuroscience context to study phenomena from synaptic connectivity in the small neuronal networks to large scale functional connectivity in the cortex. For these measures we provide analytical solutions that clearly relate different model properties. Neurites that sparsely cover space lead to a small effective radius. If the effective radius is small compared to the overall neuron size the obtained networks share similarities with the uniform random networks as each neuron connects to a small number of distant neurons. Large neurites with densely packed branches lead to a large effective radius. If this effective radius is large compared to the neuron size, the obtained networks have many local connections. In between these extremes, the networks maximize the variability of connection repertoires. The presented approach connects the properties of neuron morphology with large scale network properties without requiring heavy simulations with many model parameters. The two-steps procedure provides an easier interpretation of the role of each modeled parameter. The model is flexible and each of its components can be further expanded. We identified a range of model parameters that maximizes variability in network connectivity, the property that might affect network capacity to exhibit different dynamical regimes.

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Research group: Computational Neuro Science-CNS, Department of Signal Processing, University of Oslo  
Contributors: Acimovic, J., Mäki-Marttunen, T., Linne, M.  
Publication date: 10 Jun 2015  
Peer-reviewed: Yes

#### Publication information

Journal: Frontiers in Neuroanatomy  
Volume: 9  
Issue number: June  
Article number: 76  
ISSN (Print): 1662-5129  
Ratings:  
Scopus rating (2015): CiteScore 2.73 SJR 1.852 SNIP 0.782  
Original language: English  
ASJC Scopus subject areas: Anatomy, Neuroscience (miscellaneous), Cellular and Molecular Neuroscience  
Keywords: Graph theory, Motifs, Network connectivity, Neurite density field, Neuron morphology, Theoretical model  
DOIs:  
[10.3389/fnana.2015.00076](https://doi.org/10.3389/fnana.2015.00076)  
Source: Scopus  
Source ID: 84935865748  
Research output: Contribution to journal › Article › Scientific › peer-review

### **Distributed power allocation over indoor multi-pico stations**

A low-complexity distributed power allocation algorithm is proposed to reduce the interference and improve the transmitting rate of edge users. Different scenarios are considered and user experience of indoor communication is promoted. The simulation results prove the effectiveness of our algorithm. The proposed power control scheme ensures that more users can achieve their required rate and the fairness of different users is improved. Besides, more than 50% energy can be saved without loss in outage ability, and energy efficiency is also promoted. In addition, the proposed algorithm can be extended to scenarios that the required rates of pico stations can be changed periodically.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Beijing Institute of Petrochemical Technology, School of Information and Electronics, Beijing Institute of Technology

Contributors: Fei, Z. S., Gao, Q., Fu, Y., Isotalo, T., Niemelä, J.

Number of pages: 6

Pages: 227-232

Publication date: 1 Jun 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Journal of the Beijing Institute of Technology

Volume: 24

Issue number: 2

ISSN (Print): 1004-0579

Ratings:

Scopus rating (2015): CiteScore 0.1 SJR 0.153 SNIP 0.163

Original language: English

ASJC Scopus subject areas: Engineering(all)

Keywords: Distributed power allocation, Indoor communication, Multi-pico stations

DOIs:

10.15918/j.jbit1004-0579.201524.0214

Source: Scopus

Source ID: 84940670650

Research output: [Contribution to journal](#) > [Article](#) > [Scientific](#) > [peer-review](#)

### **Microrobotic system for multi-rate measurement of bio-based fibres Z-directional bond strength**

The core content of this study is micro-testing of microscale objects - an emerging application area for microrobotics - where microrobotics has been used in paper industry for measuring properties at the single fibre level. Pulp and paper scientists are interested to have experimental data of single fibre-fibre bond strength distribution of paper/board products in different loading modes and rates. Meeting this demand is quite challenging since the system should be able to measure the bond strength i) in the individual fibre level, ii) in different loading modes, and iii) in different loading rates. The current methods of measurement do not satisfy all these three requirements. Among the four different loading modes, the Z-directional behaviour of paper/board products is a matter of high significance for papermaking and paper converting companies. The Z-directional properties influence compressive properties, and accordingly the performance of structural paper/board products. According to the literature, there is not any reported method to facilitate the measurement of Z-directional strength at the single fibre level in different loading rates. This paper reports an in-depth study of a measurement method for experimental evaluation of Z-directional individual fibre-fibre bond strength in multiple loading rates using microrobotics and a Polyvinylidene fluoride (PVDF) film microforce sensor. The results from the measurement system are promising. In summary, the first concept for multi-rate measurement of Z-directional bond strength at the individual fibre level is developed during this work which has a high practical impact on the fibre characterization research field.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Automation Science and Engineering, Research area: Microsystems, Research area: Measurement Technology and Process Control

Contributors: Latifi, S. K., Saketi, P., Kallio, P.

Number of pages: 14

Pages: 13-26

Publication date: 24 May 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Journal of Micro-Bio Robotics

Volume: 10

Issue number: 1

Article number: 1

ISSN (Print): 2194-6418

Ratings:

Scopus rating (2015): CiteScore 1 SJR 0.423 SNIP 1.004

Original language: English

ASJC Scopus subject areas: Engineering(all)

Keywords: Microrobotics , Micro-testing , Multi-rate microforce sensing, Polyvinylidene fluoride (PVDF) , Z-directional strength

DOIs:

10.1007/s12213-015-0080-9

Research output: Contribution to journal › Article › Scientific › peer-review

### **Cancer research in the era of next-generation sequencing and big data calls for intelligent modeling**

We examine the role of big data and machine learning in cancer research. We describe an example in cancer research where gene-level data from The Cancer Genome Atlas (TCGA) consortium is interpreted using a pathway-level model. As the complexity of computational models increases, their sample requirements grow exponentially. This growth stems from the fact that the number of combinations of variables grows exponentially as the number of variables increases. Thus, a large sample size is needed. The number of variables in a computational model can be reduced by incorporating biological knowledge. One particularly successful way of doing this is by using available gene regulatory, signaling, metabolic, or context-specific pathway information. We conclude that the incorporation of existing biological knowledge is essential for the progress in using big data for cancer research.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Signal Processing, Research group: Computational Systems Biology

Contributors: Yli-Hietanen, J., Ylipää, A., Yli-Harja, O.

Publication date: 11 Apr 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Chinese Journal of Cancer

Volume: 34

Issue number: 10

Article number: 12

ISSN (Print): 1944-446X

Ratings:

Scopus rating (2015): CiteScore 2.63 SJR 1.081

Original language: English

Keywords: Cancer research, Big data, Mathematical modeling, GASTRIC-CANCER, MODULES

DOIs:

10.1186/s40880-015-0008-8

Source: WOS

Source ID: 000360225300001

Research output: Contribution to journal › Article › Scientific › peer-review

### **Testing the near field/far field model performance for prediction of particulate matter emissions in a paint factory**

A Near Field/Far Field (NF/FF) model is a well-accepted tool for precautionary exposure assessment but its capability to estimate particulate matter (PM) concentrations is not well studied. The main concern is related to emission source characterization which is not as well defined for PM emitters compared to e.g. for solvents. One way to characterize PM emission source strength is by using the material dustiness index which is scaled to correspond to industrial use by using modifying factors, such as handling energy factors. In this study we investigate how well the NF/FF model predicts PM concentration levels in a paint factory. PM concentration levels were measured during big bag and small bag powder pouring. Rotating drum dustiness indices were determined for the specific powders used and applied in the NF/FF model to predict mass concentrations. Modeled process specific concentration levels were adjusted to be similar to the measured concentration levels by adjusting the handling energy factor. The handling energy factors were found to vary considerably depending on the material and process even though they have the same values as modifying factors in the exposure models. This suggests that the PM source characteristics and process-specific handling energies should be studied in more detail to improve the model-based exposure assessment.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Physics, Danmarks Tekniske Universitet, DTU Informatik, Denmark Technical University DTU, National Research Centre for the Working Environment, Department of Micro and Nanotechnology

Contributors: Koivisto, A. J., Jensen, A. C. Ø., Levin, M., Kling, K. I., Maso, M. D., Nielsen, S. H., Jensen, K. A., Koponen, I. K.

Number of pages: 12

Pages: 62-73

Publication date: 1 Jan 2015

Peer-reviewed: Yes

#### Publication information

Journal: Environmental Sciences: Processes and Impacts

Volume: 17

Issue number: 1

ISSN (Print): 2050-7887

Ratings:

Scopus rating (2015): CiteScore 2.5 SJR 0.998 SNIP 0.923

Original language: English

ASJC Scopus subject areas: Environmental Chemistry, Public Health, Environmental and Occupational Health, Management, Monitoring, Policy and Law, Medicine(all)

DOIs:

10.1039/c4em00532e

URLs:

<http://www.scopus.com/inward/record.url?scp=84920000979&partnerID=8YFLogxK> (Link to publication in Scopus)

#### Bibliographical note

EXT="Koivisto, A. J."

Source: Scopus

Source ID: 84920000979

Research output: Contribution to journal > Article > Scientific > peer-review

### Acquisition of E5 Galileo signals in Matlab

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Research group: Wireless Communications and Positioning, Department of Electronics and Communications Engineering, Wireless Communications and Positioning (WICO)

Contributors: Stepanova, E., Kudryavtsev, I., Lohan, E.

Number of pages: 7

Pages: 36-42

Publication date: 2015

Peer-reviewed: Yes

#### Publication information

Journal: Procedia Engineering

Volume: 104

ISSN (Print): 1877-7058

Ratings:

Scopus rating (2015): CiteScore 0.56 SJR 0.239 SNIP 0.566

Original language: English

DOIs:

10.1016/j.proeng.2015.04.094

Research output: Contribution to journal > Article > Scientific > peer-review

### Comparison of Detection Techniques for Multipath Propagation of Pseudolite Signals Used in Dense Industrial Environments

Modern industrial environments with automated production machinery often require special indoor positioning and localization techniques, due to the presence of objects and the infrastructure that may obstruct the line-of-sight propagation or interfere with the behaviour of electromagnetic waves. These challenges are difficult to overcome by the widely employed GNSS positioning system designed for use in outdoor areas. One of the existing indoor positioning systems are the pseudolites, which transmit positioning signals similar to the ones used by GNSS systems. One of the sources of errors for pseudolites is the multipath propagation. Our paper compares the performances of several multipath propagation detection techniques, using Binary Offset Carrier (BOC) navigation signal and determines that errors

increases sharply whe. The receiver uses navigation signals that have multipath propagation. The techniques that we present improv. The positioning accuracy, which leads to more precise industrial processes.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Ministry of National Education. University Politehnica of Bucharest

Contributors: Alexandru, R., Lohan, E.

Number of pages: 7

Pages: 1294-1300

Publication date: 2015

Peer-reviewed: Yes

#### Publication information

Journal: Procedia Engineering

Volume: 100

Issue number: C

ISSN (Print): 1877-7058

Ratings:

Scopus rating (2015): CiteScore 0.56 SJR 0.239 SNIP 0.566

Original language: English

ASJC Scopus subject areas: Energy(all)

Keywords: Binary Offset Carrier, GNSS, Indoor positioning, Multipath propagation, Pseudolite

DOIs:

10.1016/j.proeng.2015.01.496

Source: Scopus

Source ID: 84925047361

Research output: Contribution to journal > Article > Scientific > peer-review

#### Entropy of weighted graphs with Randić weights

Shannon entropies for networks have been widely introduced. However, entropies for weighted graphs have been little investigated. Inspired by the work due to Eagle et al., we introduce the concept of graph entropy for special weighted graphs. Furthermore, we prove extremal properties by using elementary methods of classes of weighted graphs, and in particular, the one due to Bollobás and Erdős, which is also called the Randić weight. As a result, we derived statements on dendrimers that have been proven useful for applications. Finally, some open problems are presented.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Signal Processing, BioMediTech, Research Community on Data-to-Decision (D2D), Department of Computer Science & Information Systems, University of Limerick, Ireland, College of Computer and Control Engineering, Nankai University, Universität der Bundeswehr München, Department of Mechatronics and Biomedical Computer Science, UMIT, Center for Combinatorics and LPMC-TJKLC

Contributors: Chen, Z., Dehmer, M., Emmert-Streib, F., Shi, Y.

Number of pages: 14

Pages: 3710-3723

Publication date: 2015

Peer-reviewed: Yes

#### Publication information

Journal: Entropy

Volume: 17

Issue number: 6

ISSN (Print): 1099-4300

Ratings:

Scopus rating (2015): CiteScore 1.99 SJR 0.551 SNIP 1.116

Original language: English

ASJC Scopus subject areas: Physics and Astronomy(all)

Keywords: Extremal value, Graph entropy, Randić weight, Shannon's entropy, Weighted graphs

DOIs:

10.3390/e17063710

Source: Scopus

Source ID: 84934300047

Research output: Contribution to journal > Article > Scientific > peer-review



### **Assessing coupling dynamics from an ensemble of time series**

Finding interdependency relations between time series provides valuable knowledge about the processes that generated the signals. Information theory sets a natural framework for important classes of statistical dependencies. However, a reliable estimation from information-theoretic functionals is hampered when the dependency to be assessed is brief or evolves in time. Here, we show that these limitations can be partly alleviated when we have access to an ensemble of independent repetitions of the time series. In particular, we gear a data-efficient estimator of probability densities to make use of the full structure of trial-based measures. By doing so, we can obtain time-resolved estimates for a family of entropy combinations (including mutual information, transfer entropy and their conditional counterparts), which are more accurate than the simple average of individual estimates over trials. We show with simulated and real data generated by coupled electronic circuits that the proposed approach allows one to recover the time-resolved dynamics of the coupling between different subsystems.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Mathematics, University of Electronic Science and Technology of China, Institute of Computer Science (ICS) of the Foundation for Research and Technology - Hellas (FORTH), Lab of Neurophysics and Neurophysiology, Hefei National Laboratory for Physical Sciences at the Microscale, Instituto de Fisica Interdisciplinar y Sistemas Complejos (CSIC-UIB), Campus Universitat de les Illes Balears, Institut für Kognitionswissenschaft, University of Osnabrück, University of Tartu, Netherlands Institute for Neuroscience

Contributors: Gómez-Herrero, G., Wu, W., Rutanen, K., Soriano, M. C., Pipa, G., Vicente, R.

Number of pages: 13

Pages: 1958-1970

Publication date: 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Entropy

Volume: 17

Issue number: 4

ISSN (Print): 1099-4300

Ratings:

Scopus rating (2015): CiteScore 1.99 SJR 0.551 SNIP 1.116

Original language: English

ASJC Scopus subject areas: Physics and Astronomy(all)

Keywords: Ensemble, Entropy, Estimator, Time series, Transfer entropy, Trial

DOIs:

10.3390/e17041958

URLs:

<http://www.scopus.com/inward/record.url?scp=84930319366&partnerID=8YFLogxK> (Link to publication in Scopus)

#### **Bibliographical note**

EXT="Gómez-Herrero,Germán"

Source: Scopus

Source ID: 84930319366

Research output: Contribution to journal › Article › Scientific › peer-review

### **Cross-Cultural Design of Mobile Mathematics Learning Service for South African Schools**

In the era of mobile devices and services, researchers in the educational domain have been interested in how to support learning with mobile technology in both local and global contexts. Recent human-computer interaction (HCI) research in the educational domain has particularly focused on how to develop mobile learning services and how to evaluate the learning outcomes. However, learning occurs in a local cultural context and the impact of culturally sensitive issues of the design of mobile learning needs more attention. We studied mobile mathematics learning -service in a longitudinal research with over 30 South African schools during three years. Our aim was to understand culturally dependent issues which need to be taken into consideration in the design of mobile learning services. We found subjective and objective culturally dependent issues in the content, context, infrastructure and technology of mobile learning and therefore, subjects to cross-cultural research. In conclusion, we argue that localization enhances the user experience and therefore support learning.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Pervasive Computing, Research area: User experience, University of Tampere

Contributors: Vainio, T., Walsh, T., Varsaluoma, J.  
Number of pages: 12  
Pages: 81-93  
Publication date: 2015  
Peer-reviewed: Yes

#### Publication information

Journal: IADIS International Journal on WWW/Internet  
Volume: 12  
Issue number: 1  
ISSN (Print): 1645-7641  
Original language: English  
Keywords: Cross-Cultural Design, Mobile Learning, Cultural Context, Subjective and Objective Culture  
URLs:  
<http://www.iadisportal.org/ijwi/papers/2014121106.pdf>

#### Bibliographical note

EXT="Vainio, Teija"  
Research output: Contribution to journal › Article › Scientific › peer-review

#### Relational Capital for Shared Vision in Innovation Ecosystems

This paper provides a multiscopic view of the relationship profiles of businesses in three selected urban innovation ecosystems. With the Triple Helix framework, the ecosystem perspective and with shared vision for transformation initiatives, we explore relationships as structure in the metropolitan areas of Austin, TX, Minneapolis, MN, and Paris, France. Network metrics are interpreted as relationship indicators; and network visualizations reveal existing relationships and distinct patterns that structure the business ecosystems in each geographic area at the enterprise, growth and startup levels. We illustrate that relationship indicators and their visualization can be valuable resources for quantitatively and qualitatively understanding and analyzing the complexities of engagement, agility, structural cohesion, vitality, embeddedness, and linking factors in innovation ecosystems. Furthermore, these indicators highlight opportunities for the development of shared vision through interventions and network orchestration.

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Mathematics, Research group: MAT Intelligent Information Systems Laboratory  
Contributors: Russell, M. G., Huhtamäki, J., Still, K., Rubens, N., Basole, R. C.  
Number of pages: 36  
Publication date: 2015  
Peer-reviewed: Yes

#### Publication information

Journal: Triple Helix: A Journal of University-Industry-Government Innovation and Entrepreneurship  
Volume: 2  
Issue number: 1  
ISSN (Print): 2197-1927  
Original language: English  
Keywords: Ecosystem, Networks, Innovation, Business, Metropolitan, Relationships, Visualization  
DOIs:  
10.1186/s40604-015-0017-2  
Source: RIS  
Source ID: urn:F38A9FE4A6D713DF7D7D6341B47D22C2  
Research output: Contribution to journal › Article › Scientific › peer-review

#### Heat Loss Rate of the Finnish Building Stock

This paper presents a bottom-up model for studying the heat loss rate of the building stock. The model is a step towards more complex building-stock power modeling, whose goal is to predict the sources and the amount of demand response potential under different conditions. The heat loss rate is the fraction of thermal power needed to compensate for the heat loss via exterior walls, windows, roofs, floors and ventilation in the buildings. The heat loss rate depends on the physical characteristics of the building envelope and ventilation and on weather conditions.

We first examine the current state of power and energy modeling. We then describe the research object of this study and the calculation method. The calculation results presented in the third section are illustrated at the hourly level, sorted by the main source of the heating energy of the building. In addition to the analysis of the building stock level, the heat loss rate was calculated on a building level using some typical building information models for validation purposes. The validation indicated that the results obtained with the two methods were consistent and that the order of magnitude was

reasonable. The Finnish building stock was used as a research object in the demonstration of the model. Finally, some further needs for research are discussed.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Civil Engineering, Research group: Real estate development, Research group: Capacity Development of Water and Environmental Services CADWES, Research group: Service Life Engineering of Structures

Contributors: Vihola, J., Sorri, J., Heljo, J., Kero, P.

Number of pages: 8

Pages: 601-608

Publication date: 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Procedia Economics and Finance

Volume: 21

ISSN (Print): 2212-5671

Original language: English

Keywords: buildings stock, energy systems, heat loss rate, power modeling

Electronic versions:

Heat loss rate of the Finnish building stock

DOIs:

[10.1016/S2212-5671\(15\)00218-X](https://doi.org/10.1016/S2212-5671(15)00218-X)

URLs:

<http://urn.fi/URN:NBN:fi:tty-201604183810>

<http://www.sciencedirect.com/science/article/pii/S221256711500218X>

Source: RIS

Source ID: urn:16F0384ED693DEFF48B71B73D5740E05

Research output: [Contribution to journal](#) > [Article](#) > [Scientific](#) > [peer-review](#)

#### **Management and Planning Under Complexities of Metro Construction**

Nowadays, the majority of construction projects can be considered as complex and ambiguous endeavours. Each kind of construction project has its own characteristics and complexities whereas then specific management approaches and solutions are needed. Regarding the rapid development of cities, underground constructions at urban regions, such as metro construction, have been largely used for extending daily human life into underground spaces. Therefore, the recognition of the complex elements of a metro construction can play a significant role in its management and planning. The aim of this study is to investigate these complexities in subway construction. This may develop the possibility of high predictability for these challenges. As metro projects are also urban underground projects, both internal and external issues are studied and their impacts on project management are discussed. It is concluded that exceptional differences in the managing and planning of these constructions is that combined internal and external complexities are carried out simultaneously.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Civil Engineering

Contributors: Khosravi, M., Kähkönen, K.

Number of pages: 7

Pages: 415-421

Publication date: 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Procedia Economics and Finance

Volume: 21

ISSN (Print): 2212-5671

Original language: English

Keywords: Complexities, construction management, construction planning, metro construction, underground construction.

DOIs:

[10.1016/S2212-5671\(15\)00194-X](https://doi.org/10.1016/S2212-5671(15)00194-X)

#### **Bibliographical note**

EXT=" Khosravi, Mahdi"

Source: RIS

### Human Factor in Time Management

Abstract Time is the most important resource for leaders. Resources such as personnel, capital or facilities are crucial for leaders, but time is imperative. People's productivity, and hence organizations performance are heavily related to their time usage. Therefore, especially leaders should have conscious awareness towards their time personality. Time, however, is not an easy concept to handle for leader or even understand it. It has many different faces towards people. The challenge is that chronological time, where the business and management are done, is not nearly suitable when human relations and leadership are handled. Individuals experiences towards time differentiates to one another and different situations are constantly changing the experience of individual. Therefore, quite often, leaders recognize that it is hard to have schedules to match or plans to actualize within an agreed time. Some people fit more easily to same time reality with leader than others. Consequently, it is crucial for leaders also to understand how organization's members experience their time and how conscious their awareness is. Before it is possible to manage one's own time usage, personal time orientation, biases towards time, situation has to be understood consciously. This article handles research regarding time ontology in leadership and management environment and regarding peoples conscious awareness towards time and differences in their time reality. Research is done by developing and utilizing application called Chronos & Kairos which main purpose is to give possibility for thorough research for peoples' differences when experiencing time. Time ontology for leadership and management environment is presented as well as research and results of differences of people's time reality. Article argues that people's conscious awareness towards time differentiates and this issues should be recognized especially in leadership positions. Future research aspects and recommendations are also issued in this paper.

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Pori Department  
Contributors: Reunanen, T.  
Number of pages: 8  
Pages: 709-716  
Publication date: 2015  
Peer-reviewed: Yes

### Publication information

Journal: Procedia Manufacturing  
Volume: 3  
ISSN (Print): 2351-9789  
Original language: English  
Keywords: Time, Management, Human factor, Leadership, Situationality  
DOIs:  
10.1016/j.promfg.2015.07.311  
URLs:  
<http://www.sciencedirect.com/science/article/pii/S2351978915003121>

### Bibliographical note

INT=pla,"Reunanen, Tero"  
Source: RIS  
Source ID: urn:6D4C24C5CCDB54B2E73B8973CD08FBFE  
Research output: Contribution to journal › Article › Scientific › peer-review

### Monitoring urban air quality with a diffusion charger based electrical particle sensor

Abstract Urban air contains considerable amounts of harmful gaseous substances and aerosol particles. In this study, a recently introduced diffusion charger based PPS-M particle sensor (Pegasor Oy, Tampere, Finland) was evaluated for outdoor air quality measurements in urban environment. The PPS-M particle sensor was used in two stationary air quality measurement stations, one located in the roadside environment and the other in residential area, and in a mobile laboratory. The sampling of urban aerosol to the PPS-M sensor was performed without any pre-conditioning of aerosol. The sensor response to PM<sub>2.5</sub> varied between the measurements, being between 7 and 30 fA/( $\mu\text{g}/\text{m}^3$ ) depending on the aerosol source. The highest PM<sub>2.5</sub> response was observed in the roadside study for exhaust particles while the lowest PM<sub>2.5</sub> response was observed for large long range transported aerosol particles having relatively large mean particle size. The sensor signal was found to produce very linear response, with only minimal deviation, to the lung deposited particle surface area concentration (from 4.5 to 6 fA/( $\mu\text{m}^2/\text{cm}^3$ )) and to the condensation sink of urban air particles (from  $1.0 \times 10^4$  to  $1.2 \times 10^4$  fA cm<sup>3</sup>). The sensor response to particle number concentration was defined to be 0.0044 fA/(1/cm<sup>3</sup>) in roadside environment. In this environment, the signal was found to correlate also with NO and NO<sub>2</sub> concentrations of roadside air due to the same origin of particulate and gaseous pollutants. Similar correlation between NO<sub>x</sub> and the PPS-M signal was not observed in residential area.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Physics, Department of Signal Processing, Research area: Aerosol Physics, Urban circular bioeconomy (UrCirBio)

Contributors: Järvinen, A., Kuuluvainen, H., Niemi, J., Saari, S., Dal Maso, M., Pirjola, L., Hillamo, R., Janka, K., Keskinen, J., Rönkkö, T.

Publication date: 2015

Peer-reviewed: Yes

Early online date: 2014

### Publication information

Journal: Urban Climate

Volume: 14

Issue number: 3

ISSN (Print): 2212-0955

Ratings:

Scopus rating (2015): CiteScore 2.23 SJR 0.879 SNIP 1.032

Original language: English

Keywords: Particle sensor, Urban air quality, Traffic emissions, Instrument comparison

DOIs:

10.1016/j.uclim.2014.10.002

### Bibliographical note

ORG=fys,0.5

ORG=sgn,0.5

Source: RIS

Source ID: urn:C09F5E550C75A3945CB60BFFC830456C

Research output: Contribution to journal > Article > Scientific > peer-review

### Stirring the Construction Project Management with Co-creation and Continuous Improvement

Abstract Gathering information that is capable to explain customers' needs is usually seen as a quite straightforward part of the traditional construction process: a customer should be able to tell all relevant needs in the first stage so that a building could be designed and built according to the gained information. But the process is lacking of service abilities if a customer wants to modify the given information due to a change in circumstances, albeit such a change is easily caused due turbulent economic situations and long spans in real-estate development projects. Hence the customer perspective regarding the construction management (CM) process should be accommodated better. In this paper, the case studies of the four premises improvement projects are reported upon, where the CM process was altered to include and apply the concepts of continuous improvement and co-creation. The process documentation covered the impacts of the case project on the usability of the premises, the indoor climate conditions (carbon dioxide and temperature) metering, the time lapse cameras and the on-line user feedback system. The documentation consists of the minutes of the meetings, the financial reporting and the time tables. Both the processes and the results of the projects are analysed. Based on the key findings, some suggestions are put forth upon how to improve the CM process to better serve customer interests and quality improvement in the future.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector, School of Architecture

Contributors: Savolainen, J., Kähkönen, K., Niemi, O., Poutanen, J., Varis, E.

Number of pages: 8

Pages: 64-71

Publication date: 2015

Peer-reviewed: Yes

### Publication information

Journal: Procedia Economics and Finance

Volume: 21

ISSN (Print): 2212-5671

Original language: English

Keywords: Co-creation, construction management, continuous improvement, customer relations management, quality management

DOIs:

10.1016/S2212-5671(15)00151-3

### **Bibliographical note**

ORG=rak,1

ORG=ark,0

Source: RIS

Source ID: urn:76EF98A938A43DE456AFD5111BF4116C

Research output: Contribution to journal > Article > Scientific > peer-review

### **Theoretical 71-Concept Platform for Advancing Construction-related Business Management**

**Abstract** The aim is to advance business management (BM) in construction via the independent literature review. 71 construction-related BM concepts have been published between 1990 and 2013. Focal firms are based in the OECD countries. 34 (48%) concepts are related to construction management (CM), 14 (20%) concepts to industrial management and international marketing, 12 (17%) concepts to project management (PM) and 11 (15%) concepts to corporate real estate. The combined share of 16 Porterian, 16 dynamism-based, 15 organisation-based, and 10 knowledge-based concepts is 81%. The 71-concept platform is neither highly theoretically advanced, nor highly applicable. The propositions are defined for advancement.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector

Contributors: Huovinen, P.

Number of pages: 8

Pages: 80-87

Publication date: 2015

Peer-reviewed: Yes

### **Publication information**

Journal: Procedia Economics and Finance

Volume: 21

ISSN (Print): 2212-5671

Original language: English

ASJC Scopus subject areas: Business, Management and Accounting(all)

Keywords: Applied research, business management, conceptualisation, construction, literature review, real estate, school of thought

Electronic versions:

CEO2015 Pekka Huovinen Theoretical 71-concept platform Procedia Economics and Finance 21 (2015) 80-87

DOIs:

10.1016/S2212-5671(15)00153-7

URLs:

<http://urn.fi/URN:NBN:fi:tyy-201701031010>

<http://www.sciencedirect.com/science/article/pii/S2212567115001537>

Source: RIS

Source ID: urn:2259E842B1A87C3870EDBE85F572BB11

Research output: Contribution to journal > Article > Scientific > peer-review

### **Safety, Space and Structure Quality Requirements in Construction Scheduling**

**Abstract** Quality assessment of a construction project schedule can be a challenging task for project stakeholders. A little research work has addressed quality of schedules though a good project schedule can be considered as of the key factors of project success. The development of a reliable and easy to perform construction schedule quality assessment procedure seems to be a challenging task. Since Schedule Health Assessment of a construction project has to be strictly related to process requirements, it is used the 3 "S" rule as a starting point and framework for obtaining improved understanding of quality of construction schedules. The 3 "S" are Safety, Space and Structure, meaning that the planned process should provide a safe working environment to construction workers, sufficient space to perform construction activities and the required sequence of construction operations and project phases. The aim of the study is to implement a schedule quality assessment method that takes into account the 3 "S" rule of construction process. The 3 "S" requirements can be successfully integrated in a Schedule Health Assessment method, but to facilitate their implementation and control a flow-line chart is needed, thus the schedule tool becomes a new requirement for construction schedule quality control.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector,

Research group: Capacity Development of Water and Environmental Services CADWES, Research group: Real estate development

Contributors: Bragadin, M. A., Kähkönen, K.  
Number of pages: 8  
Pages: 407-414  
Publication date: 2015  
Peer-reviewed: Yes

#### Publication information

Journal: Procedia Economics and Finance  
Volume: 21  
ISSN (Print): 2212-5671  
Original language: English  
Keywords: Construction management, Project Control, Project Scheduling, Quality, Safety.  
DOIs:  
10.1016/S2212-5671(15)00193-8  
URLs:  
<http://www.sciencedirect.com/science/article/pii/S2212567115001938>  
Source: RIS  
Source ID: urn:F0EEB88647642A7A838E1B2E16C028A8  
Research output: Contribution to journal › Article › Scientific › peer-review

#### **A Cross-Cultural and Gender-Based Perspective for Online Security: Exploring Knowledge, Skills and Attitudes of Higher Education Students.**

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Pervasive Computing, Research area: Information security, University of Tampere, Department of Computer Science and Information Systems, University of Jyväskylä, Department of Computer Engineering and Information Technology of College of Information and Communication Technology at the University of Dar Es Salaam , Beijing Institute of Petrochemical Technology, University of Patras  
Contributors: Chaudhary, S., Zhao, Y., Berki, E., Valtanen, J., Li, L., Helenius, M., Mystakidis, S.  
Pages: 57-71  
Publication date: 2015  
Peer-reviewed: Yes

#### Publication information

Journal: IADIS International Journal on WWW/Internet  
Volume: 13  
Issue number: 1  
ISSN (Print): 1645-7641  
Original language: English  
Research output: Contribution to journal › Article › Scientific › peer-review

#### **Lean-tuotanto ja sen johtaminen: onnistuminen, haasteet ja soveltuminen Suomen yrityksiin ja muihin organisaatioihin**

The so-called Lean development methods are today commonly used in many types of workplaces. Many good success stories are reported but Lean-projects and the tools used in them do not always bring the desired results. The central idea in Lean thinking is the distinction of two types of efficiencies; resource efficiency and flow efficiency. Lean production systems aim at high flow efficiency but achieving it requires high resource flexibility and understanding of the uncertainty inherent in the production system. Lean-management is often related to certain methods and techniques, but they do not alone bring improvement without a holistic managerial philosophy that supports improvement on several levels of the organization's activities. Successful application of Lean management implies strategic choices and long-term commitment to organizational learning and development. The popularity of Lean management in Finnish organizations indicates that there is generally room for improvement in the organizations' operational activities. Lean management provides a structured model for development. It can bring successful results if implemented holistically and with a long-term commitment.

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Industrial Management, Research group: Center for Research on Operations Projects and Services  
Contributors: Heikkilä, J., Martinsuo, M.  
Number of pages: 7  
Pages: 18-24

Publication date: 2015

Peer-reviewed: Yes

### Publication information

Journal: Työpoliittinen aikakauskirja

Issue number: 3

ISSN (Print): 0787-510X

Original language: Finnish

URLs:

<http://www.tem.fi/files/43902/tak32015.pdf>

Research output: Contribution to journal › Article › Scientific › peer-review

## Air pressure difference between indoor and outdoor or staircase in multi-family buildings with exhaust ventilation system in Finland

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Life Cycle Effectiveness of the Built Environment (LCE@BE), Research group: Concrete and Bridge Structures, Research area: Structural Engineering, Department of Civil Engineering, Research group: Building Physics, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth

Contributors: Leivo, V., Kiviste, M., Aaltonen, A., Turunen, M., Haverinen-Shaughnessy, U.

Number of pages: 6

Pages: 1218-1223

Publication date: 2015

Peer-reviewed: Yes

### Publication information

Journal: Energy Procedia

Volume: 78C

Article number: 78C

ISSN (Print): 1876-6102

Ratings:

Scopus rating (2015): CiteScore 0.92 SJR 0.359 SNIP 0.562

Original language: English

Electronic versions:

Air pressure difference between indoor and outdoor

DOIs:

[10.1016/j.egypro.2015.11.188](https://doi.org/10.1016/j.egypro.2015.11.188)

URLs:

<http://urn.fi/URN:NBN:fi:tty-201605023900>

Research output: Contribution to journal › Article › Scientific › peer-review

## A Co-creation Centre for University–Industry Collaboration – A Framework for Concept Development

Abstract It is argued in general that future success in effective innovation creation is built on the ability to connect and manage talent, partnerships and related practical innovation processes. This makes it challenging for a university to develop an ecosystem of knowledge creation. The full benefit from a university can only be obtained if the university and society are organically linked together. The needs of society have to be at the centre of a university's activities, and flexible adjustment to changing needs is necessary but often lacking. Campus management has a major role in the facilitation of multidisciplinary interaction between students, scientists, entrepreneurs and other industry partners that inspire each other with different perspectives on the same subject. One significant tool to support open innovation with diverse stakeholders is to provide supportive spaces with relevant services. This paper aims to identify the requirements of a Co-creation Centre as a concept serving the third role of a university. The literature review was conducted and, based on the result, this paper proposes a conceptual framework for capturing the key requirements for developing a multiuser Co-creation Centre. The framework consists of the requirements on the demand and supply sides of campus management. The main findings in this paper are that different modes of knowledge conversion have different capabilities to support knowledge co-creation requirements. Knowledge co-creation process requirements in the multiuser Co-creation Centre for university–industry collaboration are best supported by originating “Ba”, which means the place where individuals share feelings, emotions, experiences, and mental models and the place where the knowledge-creation process begins. The results contribute to the concept development in campus management and provide a starting point for evaluating the success of multidisciplinary and multi-actor innovation environments.

### General information

Publication status: Published



MoE publication type: A1 Journal article-refereed  
Organisations: Department of Civil Engineering  
Contributors: Huhtelin, M., Nenonen, S.  
Pages: 137 - 145  
Publication date: 2015  
Peer-reviewed: Yes

#### Publication information

Journal: Procedia Economics and Finance  
Volume: 21  
ISSN (Print): 2212-5671  
Original language: English  
Keywords: spaces and services.  
DOIs:  
10.1016/S2212-5671(15)00160-4  
Source: Bibtex  
Source ID: urn:eaca1c4af451146bd5fea3acaaa20e86  
Research output: Contribution to journal › Article › Scientific › peer-review

#### Resilient Asset Management and Governance Fordeteriorating Water Services Infrastructure

This paper argues that strategic asset management and a sound regulatory regime are required urgently if we want to change the current paradigm of aging and decaying water services infrastructure and expand the coverage of improved water services in the developing economies. In the OECD countries access to safe water supply and sanitation has largely been ensured through substantial investment over many decades. Yet, significant investments will still be required to rehabilitate the existing infrastructures, to bring them into conformity with more stringent environmental and health regulations, and to maintain service quality in the future. In the non-OECD countries the challenges are more daunting. Large parts of their population have no access and many suffer from unsatisfactory services. Nearly one billion people lack access to clean drinking water and 2.6 billion people lack access to improved sanitation services. Lack of sound economic regulatory frameworks and enforcement regimes, and poor asset management practices, in particular underpricing of water services is a common problem throughout the world.

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Civil Engineering, Department of Chemistry and Bioengineering  
Contributors: Hukka, J. J., Katko, T. S.  
Number of pages: 8  
Pages: 112-119  
Publication date: 2015  
Peer-reviewed: Yes

#### Publication information

Journal: Procedia Economics and Finance  
Volume: 21  
ISSN (Print): 2212-5671  
Original language: English  
Keywords: aging and deteriorating water services infrastructure, investment gap, strategic asset management, regulatory and enforcement framework, sustainability.  
DOIs:  
10.1016/S2212-5671(15)00157-4  
Source: RIS  
Source ID: urn:B63C341C3AC1323B613E64632E9D1135  
Research output: Contribution to journal › Article › Scientific › peer-review

#### Social and Economic Importance of Water Services in the Built Environment: Need for More Structured Thinking

Abstract Community water supply takes priority over other water use purposes worldwide. Investment in water and sanitation systems in developing economies brings a multitude of economic and social benefits. Water infrastructure systems across the world will deteriorate unless substantially more rehabilitation is done. This paper presents a structured and hierarchical framework for sustained water services development consisting of institutions, provision, water infrastructure and production of services that hopefully create better understanding of how to develop our systems and services as part of the built environment for more sustained futures.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed  
Organisations: Department of Civil Engineering  
Contributors: Katko, T. S., Hukka, J. J.  
Number of pages: 7  
Pages: 217-223  
Publication date: 2015  
Peer-reviewed: Yes

#### Publication information

Journal: Procedia Economics and Finance  
Volume: 21  
ISSN (Print): 2212-5671  
Original language: English  
Keywords: ageing water infrastructure, institutional development, priorities, production, provision, special features.  
DOIs:  
10.1016/S2212-5671(15)00170-7  
Source: RIS  
Source ID: urn:E2D918716A9EA0A2093B36459CF62676  
Research output: Contribution to journal > Article > Scientific > peer-review

#### Systematic Search and Ranking of Physical Contradictions Using Graph Theory Principles: Toward a Systematic Analysis of Design Strategies and their Impacts: TRIZ and Knowledge-Based Innovation in Science and Industry

**Abstract** This paper presents three interconnected developments made during the course of a recent collective research work, the development of a systematic graph-based search tool for physical contradictions, a ranking approach for defining the order of criticality of the design contradictions and the associated analysis of the different design strategies that can be used to solve those contradictions or to enhance performance indicators. The systematic graph-based search for physical contradictions is using the set of elementary variables necessary to describe the system as basic input. The initial set is extracted based on taxonomy of variables combining classification work from NIST and classification of variables derived from the Bond Graph theory. The contradiction search method is in a second step classifying the set of variables into three categories: the constraint variables imposed to the designers by the context and the environment, the design variables on which the designer as the possibility to act and the performance variables that are used to evaluate the performance of the designed system. In a third step, interactions between variables are searched using two possibilities: a causal ordering algorithm developed during the course of the research or via a collective work of experts. The result of this step is a directed graph starting from the constraints variables and ending with the performance variables. In the fourth step objectives have to be assigned to the performance variables (minimal value, maximal value or target value). Those objectives are propagated back into the graph by analyzing the impact of the variables interacting with the performance variables. A physical contradiction is detected each time it is discovered that a design variable is associated with two contradictory objectives. Following this approach, a contradiction is represented as a node in the directed graph. It is possible to systematically map the different design strategies that can be used and to rank the possible impact of those design strategies. The article presents a concrete application of the approach on the case study of an air bearing and demonstrates the novelty of the approach to generate new viewpoints and insight in the analysis of the early stages of the development process. The potential impact of such type of design support is potentially very important. A future step will consist of developing a computer aided tool implementing the method.

#### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Mechanical Engineering and Industrial Systems, Aalto University, Aalto Univ, Aalto University, Aalto Univ Finland, Dept Engr Design & Prod, Sch Engr  
Contributors: Coatanéa, E., Rynnänen, L., Calonijs, O., Mokammel, F., Riitahuhta, A.  
Number of pages: 18  
Pages: 1165-1182  
Publication date: 2015  
Peer-reviewed: Yes

#### Publication information

Journal: Procedia Engineering  
Volume: 131  
ISSN (Print): 1877-7058  
Ratings:  
Scopus rating (2015): CiteScore 0.56 SJR 0.239 SNIP 0.566  
Original language: English  
Keywords: graph theory, TRIZ, physical contradiction, innovative principles, air bearing  
DOIs:  
10.1016/j.proeng.2015.12.441

#### **Bibliographical note**

EXT="Coatanéa, Eric"

EXT="Riitahuhta, Asko"

Source: RIS

Source ID: urn:4AB62BAC3A0A0D77B9BD9FDFF1D977D4

Research output: Contribution to journal > Article > Scientific > peer-review

#### **Kohti tasapuolisempaa tutkimuksen arviointia: Pääkirjoitus**

##### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Civil Engineering

Contributors: Katko, T. S.

Number of pages: 2

Pages: 4-5

Publication date: 2015

Peer-reviewed: Yes

##### **Publication information**

Journal: Ympäristöhistoria: Finnish Journal of Environmental History

Volume: 5

Issue number: 1

ISSN (Print): 1799-6953

Original language: Finnish

URLs:

[http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No1\\_2015.html](http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No1_2015.html)

Research output: Contribution to journal > Article > Scientific > peer-review

#### **Importance and challenges of sharing experiences among an international and interdisciplinary group of doctoral students**

##### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry

Contributors: Kurki, V., Sidaraviciute, R., Sörensen, J., Kibocha, S. N., Retike, I., Ikobe, G., Tichonovas, M., Elijosiute, E., Rajala, R.

Number of pages: 7

Pages: 45-51

Publication date: 2015

Peer-reviewed: Yes

##### **Publication information**

Journal: Ympäristöhistoria: Finnish Journal of Environmental History

Issue number: 1/2015

ISSN (Print): 1799-6953

Original language: English

URLs:

[http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No1\\_2015.html](http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No1_2015.html)

#### **Bibliographical note**

EXT="Kibocha, Samuel Ngari"

EXT="Rajala, Riikka"

Research output: Contribution to journal > Article > Scientific > peer-review

#### **Development of chip-surface stimulus electrode array for fully-implantable subretinal prosthesis chip**

In this study, we have developed a chip-surface stimulus electrode array for fully-implantable subretinal prosthesis chip. To realize visual restoration with high resolution, stimulus electrodes should be miniaturized and arrayed with high density. When we miniaturize them, however, their electrochemical impedances become higher and their amount of charge injection become smaller. Additionally, as the number of electrodes increases, it becomes difficult to make electrical connection to each pixel of the retinal prosthesis chip and each electrode by electrical wiring. To overcome these problems, we have developed the stimulus electrodes that have low electrochemical impedances and large charge injection capacities, and established a fabrication process of chip-surface stimulus electrode array. We fabricated the stimulus electrodes made of extremely porous platinum which had large-surface-area compared with conventional Pt. We

also fabricated the chip-surface stimulus electrodes array on the subretinal prosthesis chip which surface was rough and covered with insulator film.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Electronics and Communications Engineering, Research group: Biomaterials and Tissue Engineering Group, BioMediTech, Integrated Technologies for Tissue Engineering Research (ITTE), International Graduate School in Biomedical Engineering and Medical Physics (Ministry of Education in Finland), Graduate School of Engineering, Tohoku University

Contributors: Sasaki, Y., Suzuki, T., Iwagami, T., Tani, T., Naganuma, H., Kino, H., Hyttinen, J., Kellomäki, M., Tanaka, T.

Pages: O-253-O-254

Publication date: 17 Aug 2014

Peer-reviewed: Yes

#### Publication information

Journal: Transactions of Japanese Society for Medical and Biological Engineering

Volume: 52

ISSN (Print): 1347-443X

Ratings:

Scopus rating (2014): CiteScore 0.01 SJR 0.127 SNIP 0.038

Original language: English

ASJC Scopus subject areas: Biomedical Engineering

Keywords: Electrode, Extremely porous platinum, Retinal prosthesis

DOIs:

10.11239/jsmbe.52.O-253

Source: Scopus

Source ID: 84939439184

Research output: Contribution to journal > Article > Scientific > peer-review

#### Development of Si neural probe module with adjustable gain amplifier for neuronal signal recording

In recent years, lots of research on biomedical technologies directly using bio-signals such as BMI (Brain Machine Interface) have been performed intensively. Among bio-signals, ECoG (Electrocorticogram), LFP (Local Field Potential), and AP (Action Potential) are usually recorded especially for diagnosis, treatment, and prevention of brain diseases. These bio-signals have different amplitudes and frequency bandwidths, and the signal intensities vary accordingly with recording electrode conditions and individual variation. Therefore, a multiple bio-signals recording system having adjustable gain and bandwidth is strongly required. In this study, we designed the adjustable gain amplifier appropriate for the system, and fabricated the module composed of the amplifier and a Si neural probe for the multiple bio-signal recording in the deep brain. Additionally, we verified fundamental functions of the module by in vitro experiments.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Electronics and Communications Engineering, Research group: Biomaterials and Tissue Engineering Group, Research group: Computational Biophysics and Imaging Group, BioMediTech, Integrated Technologies for Tissue Engineering Research (ITTE), Graduate School of Engineering, Electrical and Electronics Engineering Department, Department of Bioengineering and Robotics, Tohoku University, Nagasaki Institute of Applied Science

Contributors: Tani, T., Naganuma, H., Harashima, T., Iwagami, T., Kino, H., Kiyoyama, K., Kellomäki, M., Hyttinen, J., Tanaka, T.

Pages: O-377-O-378

Publication date: 17 Aug 2014

Peer-reviewed: Yes

#### Publication information

Journal: Transactions of Japanese Society for Medical and Biological Engineering

Volume: 52

ISSN (Print): 1347-443X

Ratings:

Scopus rating (2014): CiteScore 0.01 SJR 0.127 SNIP 0.038

Original language: English

ASJC Scopus subject areas: Biomedical Engineering

Keywords: Adjustable gain amplifier, Multiple bio-signal recording, Si neural probe

DOIs:

10.11239/jsmbe.52.O-377

Source: Scopus  
Source ID: 84939449061  
Research output: Contribution to journal › Article › Scientific › peer-review

## Knowledge Management Practices in Large Companies

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Department of Information Management and Logistics, Research group: Novi, University of Vaasa  
Contributors: Väyrynen, H., Helander, N., Kukko, M.  
Number of pages: 17  
Pages: 56-72  
Publication date: 2014  
Peer-reviewed: Yes  
Early online date: 2014

### Publication information

Journal: The Macrotheme Review  
Volume: 3  
Issue number: 9  
Article number: 3(9)  
ISSN (Print): 1848-4735  
Original language: English  
Keywords: Knowledge Management, practices, survey, large companies  
Electronic versions:  
Knowledge Management Practices in Large Companies\_Author  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201604203832>

### Bibliographical note

Version: 20.4.2016 /KK  
EXT="Helander, Nina"  
Research output: Contribution to journal › Article › Scientific › peer-review

## Design: A Key Stage of Product Lifecycle

DESIGN appears to be a key and critical stage of product lifecycle. Different models have been introduced in previous research to describe the conceptual design process. The RFBS model is one of them extending and deepening the existing FBS models. A previous paper was presenting the model and assuming the possible execution of the process tasks automatically. The present paper provides an overview of the progresses that have been made in this direction during the past years. The model-driven engineering philosophy underlying the RFBS model of knowledge is concretely exemplified in this paper. The implementation through ontology and language such as SysML that was part of the model-driven engineering philosophy is concretely described in this paper in form of computer-aided tools dedicated to the conceptual design stages.

### General information

Publication status: Published  
MoE publication type: A1 Journal article-refereed  
Organisations: Intelligent dexterity for secure networked infrastructure and applications (IDSNIA), Aalto Univ, Aalto University, Aalto Univ Finland, Dept Engr Design & Prod, Sch Engr  
Contributors: Bernard, A., Coatanea, E., Christophe, F., Laroche, F.  
Number of pages: 7  
Pages: 3-9  
Publication date: 2014  
Peer-reviewed: Yes

### Publication information

Journal: Procedia CIRP  
Volume: 21  
ISSN (Print): 2212-8271  
Ratings:  
Scopus rating (2014): SJR 0.755 SNIP 1.4  
Original language: English  
Keywords: Computer-aided tools, Design method, Knowledge based system, Modelling, RFBS

DOIs:

10.1016/j.procir.2014.06.146

URLs:

<http://www.sciencedirect.com/science/article/pii/S2212827114007641>

<http://www.mendeley.com/research/design-key-stage-product-lifecycle>

Source: Mendeley

Source ID: c917d102-f71c-324d-bf73-70ffe40d606b

Research output: Contribution to journal > Article > Scientific > peer-review

### **Printed and organic diodes: devices, circuits and applications**

We review the history and current state of the art of diodes fabricated with organic semiconductors and other printable materials. In particular, we look at the integration of printed diodes into circuits and systems for applications, with particular emphasis on rectification, energy harvesting, and negative differential resistance (e.g. tunnel diodes). An overview of solution processed and printable organic and inorganic materials utilised in diodes is provided with an in depth analysis of their physics of operation. Furthermore, it is explained how the diverse array in which printed diodes can be implemented demonstrates their potential in the printed electronics industry.

### **General information**

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Electronics and Communications Engineering, Research group: Laboratory for Future Electronics,

Research group: Wireless Communications and Positioning

Contributors: Kraft, T., Berger, P., Lupo, D.

Number of pages: 19

Publication date: 29 Sep 2017

Peer-reviewed: Yes

### **Publication information**

Journal: Flexible and Printed Electronics

Volume: 2

Issue number: 3

Article number: 033001

ISSN (Print): 2058-8585

Ratings:

Scopus rating (2017): CiteScore 2.68 SJR 0.779 SNIP 1.163

Original language: English

Keywords: printed diodes, Printed electronics, Organic electronics, Energy Harvesting, rectification, tunnel diodes

DOIs:

10.1088/2058-8585/aa8ac3

Research output: Contribution to journal > Review Article > Scientific > peer-review

### **Vesi, ongelma ennen ja nyt?**

#### **General information**

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Civil Engineering

Contributors: Juuti, P.

Pages: 54-65

Publication date: May 2017

Peer-reviewed: Yes

#### **Publication information**

Journal: Ympäristöhistoria: Finnish Journal of Environmental History

Volume: 2017

Issue number: 1

ISSN (Print): 1799-6953

Original language: Finnish

URLs:

[http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/2017\\_1.html](http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/2017_1.html)

Research output: Contribution to journal > Review Article > Scientific > peer-review

## Local narratives in the long term water conflicts: Case of Turku Region in Finland

### General information

Publication status: Published  
MoE publication type: A2 Review article in a scientific journal  
Organisations: Civil Engineering  
Contributors: Juuti, P. S., Kurki, V., Rajala, R.  
Pages: 39-49  
Publication date: May 2017  
Peer-reviewed: Yes

### Publication information

Journal: Ympäristöhistoria: Finnish Journal of Environmental History  
Volume: 2017  
Issue number: 1  
ISSN (Print): 1799-6953  
Original language: English  
URLs:  
[http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/2017\\_1.html](http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/2017_1.html)  
Research output: Contribution to journal › Review Article › Scientific › peer-review

## Sata vuotta Suomen suurimmasta lavantautiepidemiasta

### General information

Publication status: Published  
MoE publication type: A2 Review article in a scientific journal  
Organisations: Civil Engineering  
Contributors: Juuti, P., Rajala, R.  
Number of pages: 3  
Pages: 12-14  
Publication date: 2017  
Peer-reviewed: Yes

### Publication information

Journal: Vesitalous  
Volume: 2017  
Issue number: 1  
ISSN (Print): 0505-3838  
Original language: Finnish  
URLs:  
<http://www.vesitalous.fi/vesitalous-lehdet/vesien-historia/>  
Research output: Contribution to journal › Review Article › Scientific › peer-review

## Valkea kaupunki, mustat vedet

### General information

Publication status: Published  
MoE publication type: A2 Review article in a scientific journal  
Organisations: Civil Engineering  
Contributors: Juuti, P., Rajala, R.  
Number of pages: 3  
Pages: 15-17  
Publication date: 2017  
Peer-reviewed: Yes

### Publication information

Journal: Vesitalous  
Volume: 2017  
Issue number: 1  
ISSN (Print): 0505-3838  
Original language: English  
URLs:  
<http://www.vesitalous.fi/vesitalous-lehdet/vesien-historia/>  
Research output: Contribution to journal › Review Article › Scientific › peer-review

### **A review study of photovoltaic array maximum power point tracking algorithms**

There are numerous maximum power point tracking (MPPT) algorithms for improving the energy efficiency of solar photovoltaic (PV) systems. The main differences between these algorithms are digital or analog implementation, simplicity of the design, sensor requirements, convergence speed, range of effectiveness, as well as hardware costs. Therefore, choosing the right algorithm is very important to the users, because it affects the electrical efficiency of PV system and reduces the costs by decreasing the number of solar panels needed to get the desired power. This paper provides the comparison of 62 different techniques used in tracking the maximum power based on literature survey. This paper is intended to be a reference for PV systems users.

#### **General information**

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Department of Electrical Engineering, Research area: Power engineering, Islamic University of Gaza

Contributors: El-Khozondar, H., El-Khozondar, R., Matter, K., Suntio, T.

Number of pages: 8

Publication date: 18 Feb 2016

Peer-reviewed: Yes

#### **Publication information**

Journal: Renewables: Wind, Water, and Solar

Volume: 3

Issue number: 1

ISSN (Print): 2198-994X

Original language: English

DOIs:

10.1186/s40807-016-0022-8

Research output: Contribution to journal › Review Article › Scientific › peer-review

### **Future in wood? Timber construction in boosting local development.**

Large scale timber construction has been on the upswing for some time in many European countries. Besides the building cluster, also regions and cities have taken advantage of the ongoing timber boom in their economic and spatial development. In this article the focus is on the South Ostrobothnia region and the city of Seinäjoki in Western Finland, where the potential of the business is quite weakly exploited regardless of favourable preconditions. By studying the key actors of the innovation network we are able to better understand the premises of the local development platform that should aim at boosting timber construction.

#### **General information**

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: School of Architecture, Research group: Urban Laboratory

Contributors: Hynynen, A.

Number of pages: 13

Pages: 127-139

Publication date: 2016

Peer-reviewed: Yes

#### **Publication information**

Journal: European Spatial Research and Policy

Volume: 23

Issue number: 1

ISSN (Print): 1231-1952

Ratings:

Scopus rating (2016): CiteScore 0.28 SJR 0.152 SNIP 0.378

Original language: English

Keywords: Urban development, regional development, timber construction, innovation network, development platform

DOIs:

10.1515/esrp-2016-0007

Research output: Contribution to journal › Review Article › Scientific › peer-review

### **Обзор параметрических методов позиционирования на основе концепции отпечатка пальца**

#### **General information**



Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Department of Automation Science and Engineering, Research area: Dynamic Systems, Department of Mathematics, Research group: MAT Positioning, Research group: Positioning

Contributors: Müller, P., Raitoharju, M., Ali-Löyty, S., Wirola, L., Piche, R.

Pages: 3-35

Publication date: 2016

Peer-reviewed: Yes

#### Publication information

Journal: Giroskopiya I Navigatsiya

Volume: 24

Issue number: 1

ISSN (Print): 0869-7035

Original language: Russian

Electronic versions:

Survey\_2016\_01\_01

DOIs:

10.17285/0869-7035.2016.24.1.003-035

URLs:

<http://urn.fi/URN:NBN:fi:tty-201609234547>

#### Bibliographical note

Translation of "A Survey of Parametric Fingerprint-Positioning Methods", Gyroscopy and Navigation, vol 7, issue 2, 2016, pp. 107-127.

Research output: Contribution to journal > Review Article > Scientific > peer-review

#### Interdisciplinary water research network building within Nordic and Baltic countries.

##### General information

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Department of Civil Engineering

Contributors: Sörensen, J., Kurki, V., Sidaraviciute, R., Ngari Kibocha, S., Retike, I., Ikobe, G., Tichonovas, M., Elijosiute, E., Rajala, R.

Number of pages: 5

Pages: 79-83

Publication date: 2015

Peer-reviewed: Yes

##### Publication information

Journal: Vatten

Issue number: 71

ISSN (Print): 0042-2886

Original language: English

URLs:

[http://www.tidskriftenvatten.se/mag/tidskriftenvatten.se/dircode/docs/48\\_article\\_4763.pdf](http://www.tidskriftenvatten.se/mag/tidskriftenvatten.se/dircode/docs/48_article_4763.pdf)

Research output: Contribution to journal > Review Article > Scientific > peer-review

#### Nanocellulose as a Piezoelectric Material

Cellulose-based nanomaterials, which are generally known as nanocelluloses, are interesting renewable biomaterials which have potential applications for example in material science, electronics and biomedical engineering and diagnostics. Cellulose has a strong ability to form lightweight, highly porous and entangled networks that make nanocellulose suitable as substrate or membrane material. Recently, also studies related to piezoelectric behavior of nanocellulose have been published. The piezoelectricity of wood was proposed already in 1955 by Eiichi Fukada, but only very slightly studied since then. Here, we show the experimental evidence of significant piezoelectric activity of different types of nanocellulose films. Wood-based cellulose nanofibril (CNF) and cellulose nanocrystals (CNC) films, and bacterial nanocellulose (BC) films have been studied. The recent results suggest that nanocellulose is a potential bio-based piezoelectric sensor material.

##### General information

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Faculty of Biomedical Sciences and Engineering, Nokia Technologies

Contributors: Tuukkanen, S., Rajala, S.  
Number of pages: 14  
Pages: 1-14  
Publication date: 29 Aug 2018

#### Host publication information

Title of host publication: Piezoelectricity - Organic and Inorganic Materials and Applications  
Publisher: InTech Open Access Publisher  
ISBN (Electronic): 978-953-51-6209-4  
Electronic versions:

61113

DOIs:

10.5772/intechopen.77025

URLs:

<http://urn.fi/URN:NBN:fi:tyy-201809052276>

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

#### Technical suitability of the fine fraction of municipal solid waste incineration bottom ash to the landfill capping liner

To protect the natural aggregates and promote the circular economy the suitable secondary aggregates have been studied intensively in last decades in Finland. One promising secondary aggregate is bottom ash from the municipal solid waste incineration (MSWI) process.

The municipal incinerator bottom ash (MIBA, also called MSWI BA) contains heavy metals and other contaminants limiting its environmental acceptability. The fines contain typically the highest concentrations of contaminants. The portion of inert particles such as rock, glass and mineral waste is higher in coarser fractions.

The aim of the study was to assess the suitability of the fines of MIBA to the mineral liner in landfill capping. Based on the environmental permit, the target permeability value for capping liner is  $k \leq 1 \cdot 10^{-9}$  m/s. The permeability of the fines of MIBA is typically around  $1 \cdot 10^{-7}$  m/s when well compacted. In order to achieve the required permeability, bentonite or other additives are needed. The grains are porous and the pH is high, typically 10-12, which effect on the amount of bentonite required. In addition, the MIBA contain high concentrations of diluting chlorides, sulfides and calcium, which decrease the swelling properties of the bentonite. The swelling capacity of bentonite decreases when permeating aggressive leakages with high cation concentration. Therefore a special polymer treated bentonite were chosen for the tests. The addition of superabsorbent polymers, which have much higher resistance to aggressive leakages, greatly improve the performance and self-healing capacity of bentonite.

First, laboratory tests were performed to estimate the proper amount and quality of the bentonite needed to achieve the permeability required. Two bentonite types were tested, the common natural bentonite and a special polymer modified bentonite produced by Cetco. The swelling index of both types of bentonite were tested by a eluate of MIBA. Several permeability tests were performed to evaluate the effect of dry density, bentonite quality and dose, and portion of coarser grains (2-5 mm).

After laboratory testing, a test area was constructed on an old waste fill to the Ämmässuo. During the construction, it was noticed that the water content effects significantly on the compaction result. The mineral liner was covered by a 1,5 mm thick LLDPE geomembrane and protective geotextile. The liner structure is covered only by a 0,5 m thick drainage layer from crushed rock. No surface layer were constructed.

After one year, the liner was exposed and studied. The quality of the structures, especially the mineral liner were visually evaluated and gas emissions were measured from the surface. The density of the layer was measured by volymeter and troxler and the water content and permeability were measured in laboratory. Based on the visual inspection the surface of the mineral liner was smooth, and the layer homogenous and hardened

#### General information

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Civil Engineering, Research group: Earth Constructions

Contributors: Leppänen, M., Sarkkila, J., Hämäläinen, H., Rinkinen, J.

Pages: 168-175

Publication date: 6 Jun 2018

#### Host publication information

Title of host publication: Proceedings of the 10th International Conference on the Environmental and Technical Implications of Construction with Alternative Materials WASCON 2018 : No Gradle, No Grave - Circular Economy into Practice

Publisher: RIL - Finnish Association of Civil Engineers

Editors: Raasakka, V., Lahtinen, P.

ISBN (Electronic): 978-951-758-631-3

Keywords: municipal solid waste bottom slag, Landfill cover, bentonite, chemical incompatibility

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **Quality evaluation on of contractor's schedule for building renovation**

In building and construction projects, the phase schedule developed by the contractor for the bidding phase, or after the contract award, has to be evaluated by owner's consultant for schedule approval. After approval, the phase schedule becomes the baseline for project control process and therefore it becomes very important to both owner and contractor to ensure that contract obligations will be respected. The baseline schedule developed by the contractor is frequently used by project supervisors or construction managers to justify (or deny) a request of time extensions, or to evaluate process efficiency and the possibility of late completion, and therefore can have major consequences in project cost management. In the owner's perspective, three are the main requirements to be fulfilled in a baseline schedule. Firstly, the construction total duration, i.e. contract time requirements about milestones and project completion. Secondly, baseline schedule entails the promised average process production rate that should fulfill contract requirements for progress payments. Thirdly, the construction safety coordination requirement, i.e. the compliance of the schedule with the safety – oriented project schedule developed by the safety coordinator (under the health and safety EU directive). In addition to this, the review of the phase schedule should give evidence of the quality of the schedule itself, i.e. give proof of its validness. In the research behind this paper, a Schedule Health Assessment procedure has been proposed for the evaluation of the schedule quality, and it is suggested to adopt the Schedule Health Assessment approach for the contractor's schedule review and approval. A case study of a renovation building project has been analyzed to test the proposed procedure and the possibility of using it for contractor's schedule approval in design-bid-build or design – build projects.

### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Civil Engineering, Research area: Construction Management and Economics, Research group: Digitalization in the real estate and construction sector, Research group: Capacity Development of Water and Environmental Services CADWES, Research group: Real estate development

Contributors: Kähkönen, K., Brandt, J.

Number of pages: 10

Pages: 175-184

Publication date: 1 Aug 2017

### **Host publication information**

Title of host publication: Re-shaping the construction industry

Publisher: ISTeA Italian Society of Science, Technology and Engineering of Architecture; Maggioli Editore

Editors: Ciribini , A., Alaimo , G., Capone , P., Daniotti , B., Dell'Osso , G., Nicolella , M.

ISBN (Electronic): 978-88-916-2486-4

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **Tools, pedagogical models, and best practices for digital storytelling**

Sharing photos and short videos with others has become increasingly popular among youth. Although sharing videos is a common activity among youth, schools are not using digital videos for learning. There is a need to study the pedagogical models that could be used in designing classroom activities involving the use of digital videos. In this chapter, digital video storytelling will be discussed in the context of learning. In this chapter, pedagogical models, examples, best practices, and outcomes that illustrate how students become engaged and motivated when using digital storytelling in knowledge creation in cross-cultural settings will be presented. The pedagogical models discussed in this chapter are Global Sharing Pedagogy (GSP) and Video Inquiry Learning (VIL). A review of existing tools and practices for digital video storytelling will be presented. The results show that students can become highly engaged in learning through digital storytelling.

### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Research group: TUT Game Lab, Pervasive Computing, University of Helsinki

Contributors: Multisilta, J., Niemi, H.

Publication date: Jul 2017

### **Host publication information**

Title of host publication: Encyclopedia of information science and technology

Publisher: IGI Global

Editor: Khosrow-Pour, M.

Edition: 4th

ISBN (Electronic): 9781591405535

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **The use of mathematical modeling for the development of a low cost fuzzy gain schedule neutralization control system**

### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Automation and Hydraulic Engineering, Faculty of Biomedical Sciences and Engineering, Federal Institute of São Paulo, Universidade Estadual de Campinas, Federal University of Uberlândia

Contributors: Sislian, R., da Silva, F. V., Gedraite, R., Jokinen, H., Rajan, D. K.

Number of pages: 15

Pages: 525-539

Publication date: 4 Feb 2017

### **Host publication information**

Title of host publication: Transactions on Engineering Technologies : World Congress on Engineering and Computer Science 2015

Publisher: Springer Singapore

ISBN (Print): 9789811027161

ISBN (Electronic): 9789811027178

ASJC Scopus subject areas: Medicine(all), Biochemistry, Genetics and Molecular Biology(all), Immunology and Microbiology(all)

DOIs:

10.1007/978-981-10-2717-8\_37

Source: Scopus

Source ID: 85055224030

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

## **Reinventing organisational creativity and innovation through adapting a service-based working culture**

### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Information Management and Logistics

Contributors: Ketonen-Oksi, S.

Number of pages: 20

Pages: 1-20

Publication date: 2017

### **Host publication information**

Title of host publication: Integrating arts and creativity into business practice

Publisher: IGI Global

Editors: Schiuma, G., Lerro, A.

ISBN (Electronic): 978-1-5225-2050-4

DOIs:

10.4018/978-1-5225-2050-4

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

## **Glass and Glass-Ceramic Scaffolds: Manufacturing Methods and the Impact of Crystallization on In-Vitro Dissolution**

### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Biomaterials and Tissue Engineering Group

Contributors: Nommeots-Nomm, A., Massera, J.

Number of pages: 19

Publication date: 2017

### **Host publication information**

Title of host publication: Scaffolds in Tissue Engineering - Materials, Technologies and Clinical Applications

Publisher: InTech Open Access Publisher

ISBN (Electronic): 978-953-51-3642-2

Electronic versions:

56625

DOIs:

10.5772/intechopen.70242

URLs:

### **Effects of Social Media on Consumers' Sports Brand Experiences and Loyalty**

Brand experience has been noted as a key attribute affecting buying behavior. Although research into the determinants of brand loyalty in sport context has grown in recent years, the focus has predominantly been on brand experience, brand personality and satisfaction, not on social media variables. In addition, we lack empirically verified evidence of the brand experience and brand loyalty relationship mediated through brand identification. In this research the authors address the role of four different social media platforms and how they drive brand loyalty through different types of brand experiences, brand identification and satisfaction to the brand experience. Structural equation modelling is used to test the model based on data from a survey of 815 ice hockey fans of a particular ice hockey team. The results show that brand experience is positively affected by brand engagement in social media and the relationship is strengthened when more different social media platforms are used for following the brand. Brand experience affects brand loyalty mainly indirectly through brand identification and satisfaction constructs.

#### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Industrial and Information Management

Contributors: Munnukka, J., Karjaluoto, H., Mahlamäki, T., Hokkanen, V.

Number of pages: 14

Pages: 1051-1064

Publication date: 2017

#### **Host publication information**

Title of host publication: Creating Marketing Magic and Innovative Future Marketing Trends : Proceedings of the 2016 Academy of Marketing Science (AMS) Annual Conference

Publisher: Springer International Publishing

Editor: Stieler, M.

ISBN (Print): 978-3-319-45596-9

#### **Publication series**

Name: Developments in Marketing Science: Proceedings of the Academy of Marketing Science

ISSN (Print): 2363-6165

DOIs:

10.1007/978-3-319-45596-9\_194

#### **Bibliographical note**

jufoid=85075

Source: Bibtex

Source ID: urn:531c45abc12e7076a1ecfdb73d8ebcbb

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **Re-inventing organizational creativity and innovation through adopting a service-based working culture**

By considering creativity to be a necessity for organisational competitiveness in today's rigorously changing working environments, this study seeks to examine whether adopting a service-based working culture could significantly improve organisational creativity and innovation. Grounded on the concepts of the Service-Dominant Logic and Complex Adaptive Systems, this research develops on understanding of the complexity of the emerging socially and digitally connected networks of individuals, teams and institutions. By introducing a novel framework for facilitating and improving the adaptability of a service-based working culture, this study offers both deliberation and practical advice for business organisations seeking valuable insight into how to develop and manage organisational creativity and innovation in increasingly digitalised service ecosystems. Specifically, the proposed framework encourages organisations to invest in the learning capacities and motivations of their employees.;

#### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Industrial and Information Management

Contributors: Ketonen-Oksi, S.

Number of pages: 20

Pages: 1-20

Publication date: 28 Dec 2016

#### **Host publication information**

Title of host publication: Integrating Art and Creativity into Business Practice

Publisher: IGI Global

ISBN (Print): 9781522520504

ISBN (Electronic): 9781522520511

ASJC Scopus subject areas: Arts and Humanities(all), Economics, Econometrics and Finance(all), Business, Management and Accounting(all)

DOIs:

10.4018/978-1-5225-2050-4.ch001

Source: Scopus

Source ID: 85016922803

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **icellfusion: Tool for fusion and analysis of live-cell images from time-lapse multimodal microscopy**

Temporal, multimodal microscopy imaging of live cells is becoming widely used in studies of cellular processes. In general, temporal sequences of images with functional and morphological data from live cells are acquired using multiple image sensors. The images from the different sources usually differ in resolution and have non-coincident fields of view, making the merging process complex. We present a new tool - iCellFusion - that performs data fusion of images from Phase-Contrast Microscopy and Fluorescence Microscopy in order to correlate the information on cell morphology, lineage and functionality. Prior to image fusion, iCellFusion performs automatic or computer-aided cell segmentation and establishes cell lineages. We exemplify its usage on time-lapse, multimodal microscopy images of bacteria producing fluorescent spots. We expect iCellFusion to assist research in Cell and Molecular Biology and the healthcare sector, where live-cell imaging is an increasingly important technique to detect and study diseases at the cellular level.

#### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Signal Processing, Research group: Laboratory of Biosystem Dynamics-LBD, Instituto de Desenvolvimento de Novas Tecnologias

Contributors: Santinha, J., Gupta, A., Martins, L., Annala, T., Häkkinen, A., Mora, A., Lloyd-Price, J., Ribeiro, A., Oliveira, S. M. D., Fonseca, J. R.

Number of pages: 29

Pages: 806-834

Publication date: 30 Aug 2016

#### **Host publication information**

Title of host publication: Biometrics: Concepts, Methodologies, Tools, and Applications

Publisher: IGI Global

ISBN (Print): 9781522509837

ISBN (Electronic): 9781522509844

ASJC Scopus subject areas: Computer Science(all)

DOIs:

10.4018/978-1-5225-0983-7.ch033

Source: Scopus

Source ID: 85015879219

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **Learning Maths with mobiles: Cross-cultural design of technology with experiences in South-Africa and Finland**

This chapter presents an overview of our experiences on cross-cultural design of technology in the context of mobile learning focusing on supporting learners to study mathematics in two different countries. The aim of our study is to discuss design issues from the perspective of two different types of cultures and reflect culturally sensitive issues based on a longitudinal study, which included empirical data from altogether over 3500 learners of grades 9 and 10. As a result we outline two focus areas: content and concept for best design practices. Furthermore, we argue that cross-cultural design of technology can help to identify culturally sensitive areas such as attitudes towards informal and collaborative learning and recognizing the local context for the content. Cross-cultural design of technology supports development of good user experience of mobile learning services for different local learning contexts.

#### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Pervasive Computing

Contributors: Vainio, T., Walsh, T.

Number of pages: 19

Pages: 741-759

Publication date: 18 Aug 2016

### Host publication information

Title of host publication: Blended Learning: Concepts, Methodologies, Tools, and Applications

Volume: 4

Publisher: IGI Global

ISBN (Print): 9781522507833

ISBN (Electronic): 9781522507840

ASJC Scopus subject areas: Social Sciences(all), Computer Science(all)

DOIs:

10.4018/978-1-5225-0783-3.ch037

### Bibliographical note

EXT="Vainio, Teija"

Source: Scopus

Source ID: 85016852656

Research output: Chapter in Book/Report/Conference proceeding > Chapter > Scientific > peer-review

### Framework for optimization and scheduling of a copper production plant

This work presents a nonlinear optimization and scheduling approach applied to a copper production plant. The solution maximizes smelting furnace production and provides valid converting schedules by simulating the evolution of the process over the optimization horizon. The production process is briefly described and the main models used to predict and calculate furnace and converter parameters are detailed. Though the solution is concentrated on the main elements, copper and iron, the optimization framework enables easy future augmentation with more complex models. A schedule optimization case is presented.

### General information

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Automation Science and Engineering, Research area: Dynamic Systems, Research area: Measurement Technology and Process Control

Contributors: Suominen, O., Mörsky, V., Ritala, R., Vilkkö, M.

Number of pages: 6

Pages: 1243-1248

Publication date: 25 Jun 2016

### Host publication information

Title of host publication: 26th European Symposium on Computer Aided Process Engineering, 2016

Volume: 38

Publisher: Elsevier Science B.V.

ISBN (Print): 9780444634283

### Publication series

Name: Computer Aided Chemical Engineering

ISSN (Print): 1570-7946

ASJC Scopus subject areas: Chemical Engineering(all), Computer Science Applications

Keywords: copper smelting, modelling, nonlinear optimization, Scheduling

DOIs:

10.1016/B978-0-444-63428-3.50212-5

URLs:

<http://www.scopus.com/inward/record.url?scp=84994385954&partnerID=8YFLogxK> (Link to publication in Scopus)

### Bibliographical note

JUF0ID=70254

Source: Scopus

Source ID: 84994385954

Research output: Chapter in Book/Report/Conference proceeding > Chapter > Scientific > peer-review

### Crowdsourcing in Business-to-Business Markets: A Value Creation and Business Model Perspective

The foundation for the analysis of this chapter builds on the value creation model of Amit and Zott (2001), where they studied the importance of sources of value creation in the field of electronic business. This model was chosen for the purposes of this study because it is developed from fundamental value creation models and dominates concerning value creation in e-business, of which crowdsourcing by utilizing social media tools represents also. Moreover, Amit and Zott's business model (2001, p. 511), which focuses on e-business for B2C companies, can be adapted for all virtual markets in general, and also applies to B2B companies (2006, p. 20). Most importantly, the model enables to analyze the relations between value creation and business model. In next, the theoretical background of value creation is opened up especially in the context of business-to-business markets, and furthermore, the model of Amit and Zott (2001) is presented. Lastly,

crowdsourcing in business-to-business markets as the research context of the present study is discussed.

#### General information

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Information Management and Logistics, Research group: Novi, Managing digital industrial transformation (mDIT)

Contributors: Bernhardt, J., Helander, N., Jussila, J., Kärkkäinen, H.

Number of pages: 11

Pages: 933-943

Publication date: Apr 2016

#### Host publication information

Title of host publication: Encyclopedia of E-Commerce Development, Implementation, and Management

Place of publication: United States

Publisher: IGI Global

Article number: 66

ISBN (Print): 978-1-4666-9787-4

Keywords: Crowdsourcing, value creation, business model

Electronic versions:

Crowdsourcing in Business-to-Business Markets

DOIs:

10.4018/978-1-4666-9787-4.ch066

URLs:

<http://urn.fi/URN:NBN:fi:ty-201608084397>

URLs:

<http://www.igi-global.com/chapter/crowdsourcing-in-business-to-business-markets/149014>

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

#### On Polyglot Programming in the Web

Different programming languages have been designed to solve problems efficiently in different domains. The goal of polyglot programming, a technique where several languages are used in the creation of a single application, is to combine and utilize the best solutions from different programming languages and paradigms in a seamless fashion. In this paper, the authors examine polyglot programming in the context of web applications, where it has been commonly used to create compelling applications, but where there is still considerable potential to improve development in various ways.

#### General information

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Pervasive Computing, Research area: Software engineering, Ada Drive

Contributors: Harmanen, J., Mikkonen, T.

Number of pages: 18

Pages: 102-119

Publication date: 2016

#### Host publication information

Title of host publication: Modern Software Engineering Methodologies for Mobile and Cloud Environments

Publisher: IGI Global

ISBN (Print): 9781466699168

ISBN (Electronic): 9781466699175

DOIs:

10.4018/978-1-4666-9916-8.ch006

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

#### Two models for hydraulic cylinders in flexible multibody simulations

In modelling hydraulic cylinders interaction between the structural response and the hydraulic system needs to be taken into account. In this chapter two approaches for modelling flexible multibody systems coupled with hydraulic actuators i.e. cylinders are presented and compared. These models are the truss-elementlike cylinder and bending flexible cylinder models. The bending flexible cylinder element is a super-element combining the geometrically exact Reissner-beam element, the  $C^1$ -continuous slide-spring element needed for the telescopic movement and the hydraulic fluid field. Both models are embedded with a friction model based on a bristle approach. The models are implemented in a finite element environment. In time the coupled stiff differential equation system is integrated using the L-stable Rosenbrock method.

#### General information



Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Civil Engineering, Research group: Structural Mechanics, Department of Mechanical Engineering and Industrial Systems, Research area: Applied Mechanics, FS Dynamics Finland Oy Ab

Contributors: Ylinen, A., Mäkinen, J., Kouhia, R.

Number of pages: 31

Pages: 463-493

Publication date: 2016

### Host publication information

Title of host publication: Computational Methods for Solids and Fluids : Multiscale Analysis, Probability Aspects and Model Reduction

Publisher: Springer

ISBN (Print): 978-3-319-27994-7

ISBN (Electronic): 978-3-319-27996-1

### Publication series

Name: Computational Methods in Applied Sciences

Volume: 41

ISSN (Print): 1871-3033

ASJC Scopus subject areas: Computational Mathematics, Modelling and Simulation, Fluid Flow and Transfer Processes, Computer Science Applications, Civil and Structural Engineering, Electrical and Electronic Engineering, Biomedical Engineering

DOIs:

10.1007/978-3-319-27996-1\_17

### Bibliographical note

JUF0ID=79940

EXT="Ylinen, Antti"

Source: Scopus

Source ID: 84964233721

Research output: Chapter in Book/Report/Conference proceeding > Chapter > Scientific > peer-review

### Probabilistic Framework for Modelling the Evolution of Geomorphic Features in 10,000-Year Time Scale: The Eurajoki River Case

In this paper the long-term evolution of the catchment area of Eurajoki River, situated in Western Finland, is studied. The modelling area, nearly 1000 km<sup>2</sup> in size, is at present mostly covered by sea. Probabilistic digital elevation model and land uplift model form the basis for the future catchment area modelling. A land uplift model is required due to the ongoing post-glacial rebound especially in the western parts of Finland. The maximum rate of land uplift in Finland is 1 cm per year while in the modelling area the land uplift rate is about 6 mm per year. The digital elevation model and land uplift model have been calculated using Monte Carlo simulation where the uncertainties in the source data have been taken into account. The probabilistic nature of these models enables also the river catchment area and river network analyses probabilistically. The analyses are done for the next 10,000 years in 1000-year intervals and 100 realizations are estimated for each time point. The results show that the catchment area expands towards the west as the land rises. An alternative river branch flowing northwards from the main course will form with a significant probability. Also, a delta area with multiple river branches is expected to form at about 7000 years after present.

### General information

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Pori Department, Research group: Data-analytics and Optimization

Contributors: Pohjola, J., Turunen, J., Lipping, T., Ikonen, A. T.

Pages: 369-382

Publication date: 2016

### Host publication information

Title of host publication: Geospatial Data in a Changing World : Selected papers of the 19th AGILE Conference on Geographic Information Science

Publisher: Springer Verlag

ISBN (Print): 978-3-319-33782-1

ISBN (Electronic): 978-3-319-33783-8

### Publication series

Name: Lecture Notes in Geoinformation and Cartography

ISSN (Print): 1863-2246

DOIs:

10.1007/978-3-319-33783-8

### **Bibliographical note**

JUFOID=82325

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **Functional model for organisational and safety culture**

Cultures are usually defined as shared values, attitudes and behaviour of certain group. The core of culture is inside person's mind. Only through behaviour or other actions of persons the culture becomes visible and shareable. Cultural artefacts and all other perceptible signs of culture are formed through action. From this perspective culture requires functionality. It does not exist nor spread without activity of individuals. In systems theory there is a methodological distinction between theoretical system and empirical system. Theoretical system "is a complex of concepts, suppositions, and propositions having both logical integration and empirical reference". Empirical system is "a set of phenomena in the observable world that is amenable to description and analysis by means of a theoretical system". However, in cultural context, theoretical models usually describe only properties of the empirical system. Usually the functionality of the culture is left undefined. Therefore theoretical models may have flaws in their ability to describe the functionality of the culture, which is essential part of the culture. In this paper we use a novel functional model to explore the functionality of the most commonly used culture models. We inspect Schein's organizational culture model, Cooper's reciprocal safety culture model and Johnson's cultural web. We study them and their functionality with our own functional model, which integrates person to sociotechnical system and shows person-sociotechnical system interaction. This study clearly shows that if culture's basis is in shared mental models, then the question whether organization is or has culture is absurd. As Antonsen has pointed out certain mandatory organizational features are clearly structural and not cultural. We also emphasize the behavioural aspect when defining cultural issues. The shared mental model alone is not sufficient requirement to define a feature as a cultural artefact, nor is the behaviour all employees share. Behaviour or action is cultural artefact only when the members of the culture have truly free will to choose their behaviour.

### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Pori Department

Contributors: Porkka, P. L.

Number of pages: 6

Pages: 907-912

Publication date: 2016

### **Host publication information**

Title of host publication: Chemical Engineering Transactions

Publisher: Italian Association of Chemical Engineering AIDIC

ISBN (Print): 9788895608396

### **Publication series**

Name: Chemical Engineering Transactions

Volume: 48

ISSN (Electronic): 2283-9216

ASJC Scopus subject areas: Chemical Engineering(all)

DOIs:

10.3303/CET1648152

### **Bibliographical note**

JUFOID=70222

Source: Scopus

Source ID: 84976878615

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **Learning maths with mobiles: Cross-cultural design of technology with experiences in South-Africa and Finland**

This chapter presents an overview of our experiences on cross-cultural design of technology in the context of mobile learning focusing on supporting learners to study mathematics in two different countries. The aim of our study is to discuss design issues from the perspective of two different types of cultures and reflect culturally sensitive issues based on a longitudinal study, which included empirical data from altogether over 3500 learners of grades 9 and 10. As a result we outline two focus areas: content and concept for best design practices. Furthermore, we argue that cross-cultural design of technology can help to identify culturally sensitive areas such as attitudes towards informal and collaborative learning and recognizing the local context for the content. Cross-cultural design of technology supports development of good user experience of mobile learning services for different local learning contexts.

### **General information**

Publication status: Published  
MoE publication type: A3 Part of a book or another research book  
Organisations: Department of Pervasive Computing, Research area: User experience  
Contributors: Vainio, T., Walsh, T.  
Number of pages: 18  
Pages: 79-96  
Publication date: 13 Jul 2015

#### Host publication information

Title of host publication: Integrating Touch-Enabled and Mobile Devices into Contemporary Mathematics Education  
Publisher: IGI Global  
ISBN (Print): 9781466687158  
ISBN (Electronic): 9781466687141  
ASJC Scopus subject areas: Social Sciences(all)  
DOIs:  
10.4018/978-1-4666-8714-1.ch004

#### Bibliographical note

EXT="Vainio, Teija"  
Source: Scopus  
Source ID: 84957956201  
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### The New Era of Crowdsourcing — Industrial Crowdsourcing

#### General information

Publication status: Published  
MoE publication type: A3 Part of a book or another research book  
Organisations: Department of Information Management and Logistics, Research group: Novi, Managing digital industrial transformation (mDIT), DIGILE – Finnish Center for Science and Innovation in the Internet Economy  
Contributors: Kärkkäinen, H., Jussila, J., Erkinheimo, P.  
Number of pages: 7  
Pages: 25-31  
Publication date: 2015

#### Host publication information

Title of host publication: Open Innovation Yearbook 2015  
Place of publication: Brussel  
Publisher: European Commission  
Editor: Salmelin, B.  
ISBN (Electronic): 978-92-79-43962-9  
Keywords: crowdsourcing, industrial crowdsourcing  
DOIs:  
10.2759/92658  
URLs:  
[http://ec.europa.eu/newsroom/dae/document.cfm?doc\\_id=9637](http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=9637)  
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### Jossakin vuoti öljy, muualla tihkuivat tiedot - etiikka katoavien rajojen ja suurten skandaalien aikakaudella

#### General information

Publication status: Published  
MoE publication type: A3 Part of a book or another research book  
Organisations: Pori Department  
Contributors: Lilja, K.  
Number of pages: 16  
Pages: 85-101  
Publication date: 2015

#### Host publication information

Title of host publication: Silmät auki It-etiikkaan  
Publisher: EDUSKUNNAN TULEVAISUUSVALIOKUNTA  
ISBN (Print): 978-951-53-3581-4  
ISBN (Electronic): 978-951-53-3582-1

### Publication series

Name: Eduskunnan tulevaisuusvaliokunnan julkaisu

Publisher: Tulevaisuusvaliokunta

No.: 12

ISSN (Print): 2342-6594

ISSN (Electronic): 2342-6608

URLs:

[https://www.eduskunta.fi/FI/tietoeduskunnasta/julkaisut/Documents/tuvj\\_12+2014.pdf](https://www.eduskunta.fi/FI/tietoeduskunnasta/julkaisut/Documents/tuvj_12+2014.pdf)

### Bibliographical note

AUX=pla,"Lilja, Kari"

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

## Townhouse-talotyypin rakennuskustannukset: kolmen suunnitteluratkaisun taloudellisuuden analysointi

### General information

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Civil Engineering

Contributors: Saari, A., Tauriainen, M.

Number of pages: 4

Pages: 94-97

Publication date: 2015

### Host publication information

Title of host publication: Nollaa parempi – Townhouse energiatehokkaassa asuinrakentamisessa

Publisher: Aalto-yliopisto

ISBN (Print): 978-952-60-6409-3

ISBN (Electronic): 978-952-60-6410-9

### Publication series

Name: Aalto University publication series Crossover

No.: 9/2015

ISSN (Print): 1799-4950

ISSN (Electronic): 1799-4969

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

## Aluetehokkuuden kustannusvaikutukset

### General information

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Civil Engineering, Aalto University

Contributors: Nisula, J., Saari, A.

Number of pages: 6

Pages: 102-107

Publication date: 2015

### Host publication information

Title of host publication: Nollaa parempi – Townhouse energiatehokkaassa asuinrakentamisessa

Publisher: Aalto-yliopisto

ISBN (Print): 978-952-60-6409-3

ISBN (Electronic): 978-952-60-6410-9

### Publication series

Name: Aalto University publication series Crossover

No.: 9/2015

ISSN (Print): 1799-4950

ISSN (Electronic): 1799-4969

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

## On service composition - dynamic formation and orchestration of service workflows

Service-oriented approach to system engineering makes engineers to rethink the way to build and maintain a system. Use of Web Service technologies enables to remove rigid connections between software components to reassemble them dynamically at run-time according to the actual needs of applications. Such an approach can in some cases provide

additional necessary functionality, which may not have been envisioned at the design time. This chapter presents an approach to orchestration allowing dynamic formation of service hierarchies in in-line with production needs, which allows tracking on all the existing service workflows. Hence the locus of control for the overall system is kept. The use of eScop Manufacturing System Ontology (MSO) for orchestration purposes is also proposed to keep the track on orchestration workflows.

#### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Automation Science and Engineering, Research group: Factory automation systems technology

Contributors: Lobov, A.

Number of pages: 9

Pages: 311-319

Publication date: 2015

#### **Host publication information**

Title of host publication: Open Knowledge-Driven Manufacturing and Logistics - The eScop Approach

Publisher: Warsaw University of Technology Publishing House

Editors: Strzelczak, S., Balda, P., Garetti, M., Lobov, A.

ISBN (Print): 978-83-7814-440-3

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

#### **Classification of Knowledge Representation Implementations in the Manufacturing Systems Domain**

Ontologies are presented as a powerful mechanism for integration of components that are located in different levels of the ISA-95 automation pyramid, which is widely known in the industrial automation domain. Hence, the development of systems that use knowledge representation is a feasible manner for the reduction of efforts, e.g. in vertical communication implementation. This kind of research is challenging because of the quantity of cross-layer information exchange. In fact, as industrial automation systems are, by nature, dynamic, process control components must be capable of adapting fast to changes. Furthermore, reconfiguration of scalable systems can be automated through ontology modeling. This chapter presents an investigation on how representation of knowledge is utilized in different industrial automation developments. In addition, main concepts and requirements for designing knowledge representation implementations are identified and described. Finally, according to this description, a classification of distinct implementations is also presented.

#### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Automation Science and Engineering, Research group: Factory automation systems technology

Contributors: Ramis Ferrer, B.

Number of pages: 10

Pages: 235-244

Publication date: 2015

#### **Host publication information**

Title of host publication: Open Knowledge-Driven Manufacturing & Logistics : The eScop Approach

Publisher: Warsaw University of Technology Publishing House

Editors: Strzelczak, S., Balda, P., Garetti, M., Lobov, A.

ISBN (Print): 978-83-7814-440-3

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

#### **A Proposal of Decentralized Architecture for OKD-MES**

Recent research work in the industrial automation field determines that the computational power of embedded devices, which is used for process control on the shop floor, is sufficient for handling new functionalities. Therefore, it becomes possible to manage knowledge that is encapsulated in embedded devices, demonstrating a decentralized solution for controlling processes at the lowest level of the ISA-95 automation pyramid. This chapter argues that part of the OKD-MES functionality can be lowered to the device level. Moreover, the presented chapter exhibits that OKD-MES representation and management of knowledge can be distributed and handled in the shop floor, where devices are capable of controlling processes that are later executed by machines. Hence, this chapter offers an alternative for the actual architecture of OKDMES, which is now centralized in terms of knowledge management. Furthermore, concepts, requirements and an early architecture for developing a decentralized OKD-MES are also shown and discussed

#### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Department of Automation Science and Engineering, Research group: Factory automation systems technology  
Contributors: Ferrer, B. R.  
Number of pages: 10  
Pages: 331-340  
Publication date: 2015

#### Host publication information

Title of host publication: Open Knowledge-Driven Manufacturing & Logistics : The eScop Approach  
Place of publication: Warsaw  
Publisher: Warsaw University of Technology Publishing House  
Editors: Strzelczak, S., Balda, P., Garetti, M., Lobov, A.  
ISBN (Print): 978-83-7814-440-3  
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### Water services heritage and institutional diversity

#### General information

Publication status: Published  
MoE publication type: A3 Part of a book or another research book  
Organisations: Department of Civil Engineering, Research group: Industrial Bioengineering and Applied Organic Chemistry  
Contributors: Katko, T. S., Juuti, P., Pietilä, P., Rajala, R.  
Publication date: 2015

#### Host publication information

Title of host publication: Water and Heritage: material, conceptual and spiritual connections  
Publisher: Sidestone Press  
Editors: Willems, W., van Schaik, H.  
ISBN (Print): 9789088902789  
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### Impact analysis of graph-based requirements models using PageRank algorithm

Managing requirements changes of complex systems and the potential impact of such changes represents a big issue for companies. Currently, commercial modelers propose tools for analyzing the direct impact of requirements changes on system design or code but the analysis of requirement change on other requirements remains seldom studied. This paper proposes an approach for the impact analysis of changes in requirements combined with a ranking of importance of requirements in graph based requirements network. Warshall algorithm is used in this paper for performing the impact analysis. Along with this approach, PageRank algorithm is used for ranking requirements according to their importance. Requirements hierarchy and their textual description of importance are considered as input for calculating their impact as well as their importance within the network of requirements. This combination of Warshall and PageRank algorithms provide significant results for helping designers in decision-making process of modifying requirements for future design versions.

#### General information

Publication status: Published  
MoE publication type: A3 Part of a book or another research book  
Organisations: Intelligent dexterity for secure networked infrastructure and applications (IDSNIA), Aalto Univ, Aalto University, Aalto Univ Finland, Dept Engr Design & Prod, Sch Engr  
Contributors: Mokammel, F., Coatanea, E., Bakhouya, M., Christophe, F., Nonsiri, S.  
Number of pages: 6  
Pages: 731-736  
Publication date: Apr 2013

#### Host publication information

Title of host publication: 2013 IEEE International Systems Conference (SysCon)  
Publisher: IEEE  
ISBN (Print): 978-1-4673-3108-1

#### Publication series

Name: 2013 IEEE International Systems Conference (SysCon)  
Keywords: Complex system, Graph theory PageRank algorithm, Impact changes analysis, PageRank algorithm, Requirements management, Warshall algorithm, complex systems, decision making, decision-making process, design engineering, formal specification, graph based requirements network, graph theory, graph-based requirements models, impact analysis, importance textual description, large-scale systems, requirement change management, requirements hierarchy, system design

DOIs:

10.1109/SysCon.2013.6549964

URLs:

<http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=6549964>

<http://www.mendeley.com/research/impact-analysis-graphbased-requirements-models-using-pagerank-algorithm>

Source: Mendeley

Source ID: bd838215-a552-3824-ba9b-f763eec0af4f

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **OSS-TMM: Guidelines for improving the testing process of open source software**

Open Source Software (OSS) products do not usually follow traditional software engineering development paradigms. Specifically, testing activities in OSS development may be quite different from those carried out in Closed Source Software (CSS) development. As testing and verification require a good deal of resources in OSS, it is necessary to have ways to assess and improve OSS testing processes. This paper provides a set of testing guidelines and issues that OSS developers can use to decide which testing techniques make most sense for their OSS products. This paper 1) provides a checklist that helps OSS developers identify the most useful testing techniques according to the main characteristics of their products, and 2) outlines a proposal for a method that helps assess the maturity of OSS testing processes. The method is a proposal of a Maturity Model for testing processes (called OSS-TMM). To show its usefulness, the authors apply the method to seven real-life projects. Specifically, the authors apply the method to BusyBox, Apache Httpd, and Eclipse Test and Performance Tools Platform to show how the checklist supports and guides the testing process of these OSS products.

#### **General information**

Publication status: Published

MoE publication type: A3 Part of a book or another research book

Organisations: Università degli Studi Dell'Insubria, Former organisation of the author

Contributors: Morasca, S., Taibi, D., Tosi, D.

Number of pages: 20

Pages: 59-78

Publication date: 28 Feb 2013

#### **Host publication information**

Title of host publication: Open Source Software Dynamics, Processes, and Applications

Publisher: IGI Global

ISBN (Print): 1466629371, 9781466629370

ISBN (Electronic): 9781466629387

ASJC Scopus subject areas: Computer Science(all)

DOIs:

10.4018/978-1-4666-2937-0.ch004

URLs:

<http://www.scopus.com/inward/record.url?scp=84944882361&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84944882361

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

### **Participatory service design and community involvement in designing future-ready sustainable learning landscapes**

The United Nations Sustainable Development Goals (SDGs) work as a new agenda for sustainable development globally. Many if not most of the SDGs can be combined with different levels of education. This paper leans on previous work in Sustainable Education Design (SED), which looked at sustainability from its multifaceted angles with a broad global scope. The context of the study is a campus at a research-intensive Finnish university. The methodology entailed participatory service design approaches. For piloting, one classroom was chosen as a test bed. The data consist of workshops, use walks and structured interviews. The analysis started from identifying KPIs of sustainable learning environment creation, after which these were tested against Sustainable Education Design Criteria described in a manual book earlier. The key findings include nine preliminary alternative KPIs that were merged with previous SED criteria and related SDGs. The alternative KPIs were trialled in the test bed environment. These proposed alternative KPIs can be used as indicators for sustainability, innovation and learning during participatory change processes and in evaluating the outcome.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Civil Engineering, Research group: Responsible Construction, Helsinki University

Contributors: Sandström, N., Nevgi, A., Nenonen, S.

Publication date: 2 Sep 2019

### Host publication information

Title of host publication: SBE 19 - Emerging Concepts for Sustainable Built Environment 22–24 May 2019, Helsinki, Finland  
Publisher: IOP Publishing

### Publication series

Name: IOP Conference Series: Earth and Environmental Science  
Volume: 297  
ISSN (Print): 1755-1307  
ASJC Scopus subject areas: Environmental Science(all), Earth and Planetary Sciences(all)  
Electronic versions:  
Sandström\_2019\_IOP\_Conf.\_Ser.\_Earth\_Environ.\_Sci.\_297\_012031  
DOIs:  
10.1088/1755-1315/297/1/012031  
URLs:  
<http://urn.fi/URN:NBN:fi:tuni-201910153860>

### Bibliographical note

jufoid=85001  
Source: Scopus  
Source ID: 85072832468  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Research-industry collaboration: a review of the literature on evaluation methods and motivations

Relationships and collaborations between research and industry play an essential role in sustaining innovation. Therefore, different types of innovation models developed to refer to a set of interaction channels, mechanism and forms of linkage between academia and industry. The latter studies highlight enhancing and diminishing factors of collaboration management, practices on knowledge interactions and collaborative relationships on various levels depending on considered industrial sectors. This review establishes the state of current knowledge in the field and classifies key metrics and indicators for evaluation of research-industry collaboration linkage.

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Industrial Engineering and Management, Research group: Center for Innovation and Technology Research, CERN, European Organization for Nuclear Research (CERN)  
Contributors: Solodko, A., Mäkinen, S., Lasheras, N. C., Bedolla, J. S., Saari, U.  
Number of pages: 7  
Publication date: 29 Aug 2019

### Host publication information

Title of host publication: PICMET 2019 Conference : August 25-29, 2019, Portland, Oregon, USA  
Place of publication: Portland  
Article number: 19R0108  
ISBN (Electronic): 978-1-890843-40-3  
URLs:  
<http://urn.fi/URN:NBN:fi:tuni-201909273532>  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Profile extraction and deep autoencoder feature extraction for elevator fault detection

In this paper, we propose a new algorithm for data extraction from time series signal data, and furthermore automatic calculation of highly informative deep features to be used in fault detection. In data extraction elevator start and stop events are extracted from sensor data, and a generic deep autoencoder model is also developed for automated feature extraction from the extracted profiles. After this, extracted deep features are classified with random forest algorithm for fault detection. Sensor data are labelled as healthy and faulty based on the maintenance actions recorded. The remaining healthy data are used for validation of the model to prove its efficacy in terms of avoiding false positives. We have achieved 100% accuracy in fault detection along with avoiding false positives based on new extracted deep features, which outperforms results using existing features. Existing features are also classified with random forest to compare results. Our developed algorithm provides better results due to the new deep features extracted from the dataset compared to existing features. This research will help various predictive maintenance systems to detect false alarms, which will in turn reduce unnecessary visits of service technicians to installation sites.

### General information

Publication status: Published



MoE publication type: A4 Article in a conference publication

Organisations: Automation Technology and Mechanical Engineering, Research group: Innovative Hydraulic Automation

Contributors: Mishra, K., Krogerus, T., Huhtala, K.

Number of pages: 8

Pages: 313-320

Publication date: 28 Jul 2019

#### Host publication information

Title of host publication: 16th International Conference on Signal Processing and Multimedia Applications : SIGMAP 2019, 26-28 July, 2019, Prague, Czech Republic

Volume: 16

Place of publication: Prague, Czech Republic

Publisher: SCITEPRESS

Editor: Callegari, C.

Edition: 2019

ISBN (Print): 978-989-758-378-0

ISBN (Electronic): 978-989-758-378-0

ASJC Scopus subject areas: Computer Science(all)

DOIs:

10.5220/0007802003130320

URLs:

<https://www.scitepress.org/ProceedingsDetails.aspx?ID=0N9+1/B4ih0=&t=1>

<http://www.wikicfp.com/cfp/servlet/event.showcfp?eventid=82467&copyownerid=45217>

<http://www.sigmap.icete.org/?y=2019>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Empirical study of good, bad and ugly modular engineering solutions in machinery manufacturing industry

This study examines the relationship between the product structuring principles chosen in modular product families and the business results of companies. In the three case studies of the article, it can be seen that products that meet the modularity definitions discussed in the literature have been able to utilise the benefits of modularity in a very varied way. In one business case, the effect of modularity on business has been negative. In two other cases, the effect has been positive - in one of these even the profitability of the business has significantly improved. The aim of this article is to identify whether product designing consistently has been following some product structuring principles previously mentioned in modularisation literature or whether case studies bring new principles to consciousness. In all case studies, the product structuring principles used are also discussed in the previous modularisation studies at a varying extent. In the discussion section, we raise the question of whether the recording and use of product structuring principles in design briefs could lead to making the product design decisions that affect the business positively.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Automation Technology and Mechanical Engineering, Research area: Design, Development and LCM

Contributors: Juuti, T., Pakkanen, J., Lehtonen, T.

Number of pages: 10

Pages: 2981-2990

Publication date: 26 Jul 2019

#### Host publication information

Title of host publication: Proceedings of the Design Society: International Conference on Engineering Design : The 22nd International Conference on Engineering Design, ICED19, Delft, The Netherlands, 5-8 August 2019

Publisher: Cambridge University Press

#### Publication series

Name: Proceedings of the Design Society: International Conference on Engineering Design

ISSN (Electronic): 2220-4342

DOIs:

10.1017/dsi.2019.305

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Actors' agency in the routines of innovation project portfolio management

Innovation project portfolio management (IPPM) is carried out through various routines of assessing, prioritizing, selecting and coordinating projects. Empirical research increasingly suggests that the official routines are not necessarily used, but personnel use agency, i.e., individual situation-specific judgment in their practice of IPPM. This agency perspective is not sufficiently understood, so far. The purpose of this study is to explore different actors' agency in implementing IPPM, covering managers, personnel and external stakeholders. The goal is increased knowledge on implementing IPPM in

dynamic contexts and development of propositions for better IPPM frameworks that account for different actors' agency. The qualitative case study with two innovative project-based firms reveals different approaches to IPPM agency across four different actor categories. The nature of the innovation project portfolios is discussed especially in terms of uncertainty and the maturity of the IPPM routines as situation-specific factors relevant in enabling and restraining project actors' agency in IPPM. The results contribute by proposing agency as a novel perspective to IPPM research, showing evidence of it in highly innovative contexts, and thereby enabling the theorization of situation-specific practice of IPPM.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial Engineering and Management, Research group: Center for Research on Operations Projects and Services, Research group: Center for Research on Project and Service Business (CROPS)

Contributors: Martinsuo, M., Vuorinen, L.

Number of pages: 26

Publication date: 26 Jun 2019

#### **Host publication information**

Title of host publication: Proceedings of the EURAM European Academy of Management Conference 2019 : 26-28 June 2019, Lisbon, Portugal

Publisher: European Academy of Management, EURAM

ISBN (Electronic): 978-2-9602195-1-7

#### **Publication series**

Name: EURAM conference

ISSN (Print): 2466-7498

URLs:

<http://urn.fi/URN:NBN:fi:tyy-201908272032>

URLs:

<http://www.euramonline.org/submissions-guidelines-2019/author-s-guidelines.html>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **The circular economy of projects**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial Engineering and Management, Research group: Center for Research on Project and Service Business (CROPS)

Contributors: Ahola, T., Martinsuo, M.

Publication date: Jun 2019

#### **Host publication information**

Title of host publication: European Academy of Management Conference EURAM 2019 : 26-28 June, Lisbon, Portugal

ISBN (Electronic): 978-2-9602195-1-7

#### **Publication series**

Name: European academy of management annual conference

ISSN (Print): 2466-7498

URLs:

<http://www.euramonline.org/annual-conference-2019.html>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Normalization of deviance in the construction industry, a managerial perspective**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial Engineering and Management, Research group: Center for Research on Project and Service Business (CROPS), London South Bank University (LSBU) and CIB, NTNU Norwegian University of Science and Technology

Contributors: Hajikazemi, S., Ahola, T., Aaltonen, K., Aarseth, W., Andersen, B.

Publication date: Jun 2019

#### **Host publication information**

Title of host publication: European Academy of Management Conference 2019, EURAM : 26-28 June, Lissabon, Portugal  
ISBN (Electronic): 978-2-9602195-1-7

#### Publication series

Name: European academy of management annual conference

ISSN (Electronic): 2466-7498

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Knowledge management practices to overcome network-level knowledge barriers: an artificial intelligence powered literature review

##### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Information and Knowledge Management, Research group: Knowledge and Learning Research Center

Contributors: Vuori, V., Helander, N.

Publication date: Jun 2019

##### Host publication information

Title of host publication: Proceedings of International Forum on Knowledge Asset Dynamics 2019 : 5-7 June 2019, Matera, Italy

ISBN (Electronic): 978-88-96687-12-3

##### Publication series

Name: IFKAD Proceedings eBooks

ISSN (Electronic): 2280-787X

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Double-side pumped membrane external-cavity surface-emitting laser (MECSEL) with increased efficiency emitting > 3 W in the 780 nm region

We demonstrate a double-side pumped MECSEL emitting more than 3 W of output power in the 780 nm wavelength region. The laser exhibits an efficiency as high as 34.4 %.

##### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics

Contributors: Kahle, H., Phung, H., Penttinen, J., Rajala, P., Tukiainen, A., Ranta, S., Guina, M.

Publication date: 1 May 2019

##### Host publication information

Title of host publication: 2019 Conference on Lasers and Electro-Optics, CLEO 2019 - Proceedings

Publisher: IEEE

ISBN (Electronic): 9781943580576

ASJC Scopus subject areas: Spectroscopy, Industrial and Manufacturing Engineering, Safety, Risk, Reliability and Quality, Management, Monitoring, Policy and Law, Electronic, Optical and Magnetic Materials, Radiology Nuclear Medicine and imaging, Instrumentation, Atomic and Molecular Physics, and Optics

DOIs:

10.23919/CLEO.2019.8749958

##### Bibliographical note

INT=phys,"Rajala, Patrik"

Source: Scopus

Source ID: 85069191246

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Optical Frequency Comb Photoacoustic Spectroscopy

We combine for the first time a mid-infrared optical frequency comb Fourier transform spectrometer with cantilever-enhanced photoacoustic detection and measure high-resolution broadband spectra of the fundamental band of methane in a few milliliter sample volume.

##### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, Energy Technology and Thermal Process Chemistry, University of Helsinki  
Contributors: Sadiq, I., Mikkonen, T., Vainio, M., Toivonen, J., Foltynowicz, A.  
Publication date: 1 May 2019

#### Host publication information

Title of host publication: 2019 Conference on Lasers and Electro-Optics, CLEO 2019 - Proceedings

Publisher: IEEE

ISBN (Electronic): 9781943580576

ASJC Scopus subject areas: Spectroscopy, Industrial and Manufacturing Engineering, Safety, Risk, Reliability and Quality, Management, Monitoring, Policy and Law, Electronic, Optical and Magnetic Materials, Radiology Nuclear Medicine and imaging, Instrumentation, Atomic and Molecular Physics, and Optics

DOIs:

10.23919/CLEO.2019.8749688

Source: Scopus

Source ID: 85069190764

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Frequency Comb Generation in a Continuous-Wave Pumped Second-Order Nonlinear Waveguide Resonator

Optical frequency comb generation has been experimentally studied using an integrated system based on a lithium niobate waveguide resonator featuring a strong quadratic nonlinearity. Our theoretical model shows good agreement with the experimental results.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, Paderborn University, University of Helsinki, VTT Technical Research Centre of Finland

Contributors: Abdallah, Z., Stefszky, M., Ulvila, V., Silberhorn, C., Vainio, M.

Publication date: 1 May 2019

#### Host publication information

Title of host publication: 2019 Conference on Lasers and Electro-Optics, CLEO 2019 - Proceedings

Publisher: IEEE

ISBN (Electronic): 9781943580576

ASJC Scopus subject areas: Spectroscopy, Industrial and Manufacturing Engineering, Safety, Risk, Reliability and Quality, Management, Monitoring, Policy and Law, Electronic, Optical and Magnetic Materials, Radiology Nuclear Medicine and imaging, Instrumentation, Atomic and Molecular Physics, and Optics

DOIs:

10.23919/CLEO.2019.8750403

Source: Scopus

Source ID: 85069196416

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### High-Q resonance train in a plasmonic metasurface

We experimentally demonstrate a plasmonic surface that supports a series of high-quality-factor ( $Q \approx 100$ ) surface lattice resonances. These resonances are enabled by tuning the thickness of the top-cladding layer to confine higher order diffraction-orders.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, University of Ottawa, Canada, Iridian Spectral Technologies, University of Rochester Institute of Optics

Contributors: Saad-Bin-Alam, M., Reshef, O., Huttunen, M. J., Carlow, G., Sullivan, B., Menard, J. M., Dolgaleva, K., Boyd, R. W.

Publication date: 1 May 2019

#### Host publication information

Title of host publication: 2019 Conference on Lasers and Electro-Optics, CLEO 2019 - Proceedings

Publisher: IEEE

ISBN (Electronic): 9781943580576

ASJC Scopus subject areas: Spectroscopy, Industrial and Manufacturing Engineering, Safety, Risk, Reliability and Quality, Management, Monitoring, Policy and Law, Electronic, Optical and Magnetic Materials, Radiology Nuclear Medicine and imaging, Instrumentation, Atomic and Molecular Physics, and Optics

DOIs:

10.23919/CLEO.2019.8750206

Source: Scopus

Source ID: 85069156893

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **A Semantic Meta-Model Repository for Lightweight M2M**

One of the biggest problems in managing devices for the Internet of Things (IoT) is the ability for a management server to independently discover and retrieve data models for vendor-specific devices. At the same time, several device management methods also lack methods for device vendors to share their data models in a consistent manner. This paper presents the design and implementation of a repository that can flexibly accommodate many needs with regards to these issues, and allows device vendors to publish semantically similar data models as well as attach meta-data to these models. A Machine-to-Machine (M2M) communication interface also allows a management server to communicate with the repository. We show how these techniques can be used with the Lightweight Machine-to-Machine (LWM2M) standard.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Computing Sciences, Research area: Information security, Ericsson

Contributors: Silverajan, B., Zhao, H., Kamath, A.

Number of pages: 5

Pages: 468-472

Publication date: 11 Apr 2019

#### **Host publication information**

Title of host publication: 2018 IEEE International Conference on Communication Systems, ICCS 2018

Publisher: IEEE

ISBN (Electronic): 9781538678640

ASJC Scopus subject areas: Computer Networks and Communications, Hardware and Architecture, Information Systems and Management, Aerospace Engineering

Keywords: data model repository, IoT device management, LWM2M

DOIs:

10.1109/ICCS.2018.8689185

Source: Scopus

Source ID: 85065038511

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Muovipäälysteisten lattioiden vaurioituminen kosteuden vaikutuksesta**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Civil Engineering, Research group: Concrete and Bridge Structures, Materials Science and Environmental Engineering, Research group: Service Life Engineering of Structures, Research area: Structural Engineering

Contributors: Leivo, V., Sarlin, E., Suonketo, J., Pikkuvirta, J., Pentti, M.

Number of pages: 6

Pages: 383-388

Publication date: 14 Mar 2019

#### **Host publication information**

Title of host publication: Sisäilmastoseminaari 2019: 14.3.2019 : Sisäilmayhdistys raportti 37

Publisher: SIY SISÄILMATIETO OY

ISBN (Electronic): 978-952-5236-49-1

#### **Publication series**

Name: SIY Raportti

Publisher: SIY Sisäilmätieto Oy

No.: 37

ISSN (Electronic): 1237-1866

URLs:

[https://www.sisailmautiset.fi/Sisailmastoseminaari\\_2019.pdf](https://www.sisailmautiset.fi/Sisailmastoseminaari_2019.pdf)

#### **Bibliographical note**

INT=ceng,"Pikkuvirta, Jussa"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Large mode area double clad ytterbium tapered fiber with circular birefringency**

We demonstrated, for the first time to our best knowledge, an active tapered double clad fiber with circular birefringence and 35  $\mu\text{m}$  core diameter. The output radiation had perfect beam quality ( $M^2=1.18/1.1$ ) and linearly polarized light with 15 dB of PER. The developed double clad active fiber was investigated for amplification of picosecond pulses in allfiber MOPA system. The MOPA system delivered 50 ps pulses with 55 W of the average power revealed 34.4 dB gain of the booster amplifier.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, Research group: Nanophotonics, Tampere University, Ampliconix Ltd, Kotel'nikov Institute of Radio Engineering and Electronics

Contributors: Rissanen, J., Fedotov, A., Noronen, T., Gumenyuk, R., Chamorovskii, Y., Kolosovskii, A., Voloshin, V., Vorobev, I., Odnoblyudov, M., Filippov, V.

Number of pages: 8

Publication date: 7 Mar 2019

#### **Host publication information**

Title of host publication: Proceedings of SPIE : Fiber Lasers XVI: Technology and Systems

Publisher: SPIE-INT SOC OPTICAL ENGINEERING

Editors: Carter, A. L., Dong, L.

#### **Publication series**

Name: Proceedings of SPIE

Publisher: SPIE

Volume: 10897

ISSN (Print): 0277-786X

Keywords: polarization, ytterbium, picosecond phenomena, birefringence, fiber amplifier, fiber laser

Electronic versions:

Large mode area double clad ytterbium tapered fiber with circular birefringency

DOIs:

10.1117/12.2508811

URLs:

<http://urn.fi/URN:NBN:fi:tty-201903291360>

#### **Bibliographical note**

jufoid=71479

EXT="Noronen, Teppo"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Analysis of upconversion nanoparticles as an active medium for upconversion light sources**

In the presented work, we investigated the optical and thermal stability of upconversion nanoparticles based on the three widely used matrices (NaYF<sub>4</sub>, Y<sub>2</sub>O<sub>3</sub>, LaF<sub>3</sub>). Analysis of the upconversion emission as a function of pump power density in a wide range revealed a multi-stage functional dependence. The stages of linear growing, saturation and degradation with both reversible and irreversible characters were discovered. For matrices of nanoparticles with low-temperature stability (NaYF<sub>4</sub>), the dependence proves to be irreversible that could cause by a change in the structure and chemical composition of the matrix. Reversible dependence occurs in matrices with high-temperature stability (Y<sub>2</sub>O<sub>3</sub> and LaF<sub>3</sub>) and is caused by multiphonon nonradiative relaxation, which can be temperature-stimulated because of self-heating and low air-cooling of the crystal matrixes with low thermal conductivity.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, Research group: Nanophotonics, A. M. Prokhorov General Physics Institute, Russian Academy of Sciences, Institute of Physics, University of Tartu

Contributors: Fedotov, A., Pominova, D., Orlovskaya, E., Orlovskii, Y., Niemi, T., Gumenyuk, R.

Number of pages: 9

Publication date: 1 Mar 2019

#### **Host publication information**

Title of host publication: Proceedings of SPIE : Optical Components and Materials XVI

Volume: 10914

Publisher: S P I E - International Society for Optical Engineering

Article number: 109140R  
ISBN (Print): 9781510624702

#### Publication series

Name: Proceedings of SPIE : the International Society for Optical Engineering  
Publisher: SPIE, The International Society for Optical Engineering  
Volume: 10914  
ISSN (Print): 0277-786X  
ISSN (Electronic): 1996-756X  
Keywords: upconversion, nanoparticles, luminescence, erbium, ytterbium, light sources  
Electronic versions:

Analysis of upconversion nanoparticles as an active medium for upconversion light sources

DOIs:

10.1117/12.2507599

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### A model for profiling information and knowledge management in the public sector

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Industrial Engineering and Management, Information and Knowledge Management, Research group: Operations and Supply Chain Group (OSCG)  
Contributors: Jääskeläinen, A., Sillanpää, V., Helander, N.  
Publication date: 2019

#### Host publication information

Title of host publication: Proceedings of 14th IFKAD 2019 conference : Matera, Italy, 5-7 June.  
ISBN (Electronic): 978-88-96687-12-3

#### Publication series

Name: Proceedings IFKAD  
ISSN (Electronic): 2280-787X  
URLs:

<https://www.ifkad.org/previous-editions/ifkad-2019/>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Mean and variability in RNA polymerase numbers are correlated to the mean but not the variability in size and composition of Escherichia coli cells

Cell morphology differs with cell physiology in general and with gene expression in particular. We investigate the degree to which these relationships differ with medium richness. Using Escherichia coli cells with fluorescently tagged  $\beta'$  subunits, flow cytometry, and statistical analysis, we study at the single-cell level the correlation between parameters associated to cell morphology and composition (FSC, SSC, and Width channels) and GFP tagged RNA polymerase (RNAP) levels (FITC channel). From measurements in three media differing in richness (M63, LB, and TB) and, thus, cell growth rates, we find that the mean and cell-to-cell variability in RNAP levels are correlated to the mean values of FSC, SSC, and/or Width. Further, in all growth conditions considered, RNAP levels are positively correlated to FSC, SSC, and Width at the single-cell level, with the correlation decreasing for increasing medium richness. Overall, the results suggest that the mean and cell-to-cell variability in levels of RNAP, a master regulator of gene expression, are correlated to the mean values of the parameters assessing the cellular morphology and composition, as measured by flow cytometry, but they do not correlate to the degree of variability of these parameter values.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Research group: Laboratory of Biosystem Dynamics-LBD, BioMediTech, Department of Chemistry and Bioengineering  
Contributors: Almeida, B., Chauhan, V., Kandavalli, V., Ribeiro, A.  
Number of pages: 8  
Pages: 226-233  
Publication date: 2019

#### Host publication information

Title of host publication: BIOINFORMATICS 2019 - 10th International Conference on Bioinformatics Models, Methods and Algorithms, Proceedings; Part of 12th International Joint Conference on Biomedical Engineering Systems and Technologies, BIOSTEC 2019

Publisher: SCITEPRESS

Editors: De Maria, E., Gamboa, H., Fred, A.

ISBN (Electronic): 9789897583537

ASJC Scopus subject areas: Biomedical Engineering, Electrical and Electronic Engineering

Keywords: Cell-to-cell Variability, Flow Cytometry, RNA Polymerase, Single-cell Biology, Statistical Analysis

DOIs:

10.5220/0007456102260233

Source: Scopus

Source ID: 85064697521

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Random lasing control with optical spatial solitons in nematic liquid crystals

We discuss the synergy of reorientational self-focusing and random lasing in a dye-doped nematic liquid crystalline material. The laser emission resulting from amplification and multiple scattering inside the medium can be either modulated or triggered depending on the energy of the visible pump beam and the power of the near-infrared spatial soliton, respectively exciting the two nonlinear responses. Moreover, the presence of the self-induced waveguide improves the properties of the emitted beam, i. e., directionality and profile. Finally, the laser light can be re-directed by steering the spatial soliton with the aid of an external low-frequency electric field.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, Research group: Nonlinear Optics, University "Roma Tre", Case Western Reserve University, Univ Roma Tre, Roma Tre University, Dept Elect Engr, NooEL

Contributors: Piccardi, A., Perumbilavil, S., Kauranen, M., Strangi, G., Assanto, G.

Number of pages: 5

Pages: 289-293

Publication date: 2019

#### Host publication information

Title of host publication: PHOTOPTICS 2019 - Proceedings of the 7th International Conference on Photonics, Optics and Laser Technology

Publisher: SCITEPRESS

Editors: Ribeiro, P., Raposo, M., Andrews, D.

ISBN (Electronic): 9789897583643

ASJC Scopus subject areas: Atomic and Molecular Physics, and Optics

Keywords: Nematic Liquid Crystals, Optical Spatial Solitons, Random Laser

DOIs:

10.5220/0007575102890293

#### Bibliographical note

EXT="Assanto, Gaetano"

Source: Scopus

Source ID: 85064602881

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### MECSELS with direct emission in the 760 nm to 810 nm spectral range: A single- and double-side pumping comparison and high-power continuous-wave operation

We compared single-side pumping (SSP) and double-side pumping (DSP) of a semiconductor membrane external-cavity surface-emitting laser (MECSEL). The MECSEL's active region was based on a 4×3 AlGaAs quantum well (QW) structure. This structure was embedded between two silicon carbide (SiC) wafer pieces that were used as transparent intra-cavity (IC) heat spreaders creating a symmetrical cooling environment. The MECSEL structure targeted emission at 780nm and was operated at 20°C heat sink temperature. Via DSP the differential efficiency was improved from 31.9% to 34.4%. The laser threshold was reduced from 0.79 W to 0.69 W of absorbed pump power while the maximum output power was increased from 3.13 W to 3.22 W. The DSP configuration enabled these improvements by a reduced thermal resistance of the gain element by 9%. The MECSEL operated at a fundamental Gaussian TEM<sub>00</sub> mode profile and the beam quality was measured to be  $M^2 < 1.09$ . We further demonstrate a maximum tuning range from 767 nm to 811 nm. A similar active region with about half the thickness (2×3 AlGaAs QWs) was investigated using the DSP configuration and first results are presented here. 500-μm-thick sapphire IC heat spreaders were used instead of SiC. The output power exceeded 0.5W and the emission was spectrally located around 770 nm.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication



Organisations: Physics

Contributors: Kahle, H., Penttinen, J. P., Phung, H. M., Rajala, P., Tukiainen, A., Ranta, S., Guina, M.

Publication date: 2019

#### Host publication information

Title of host publication: Vertical External Cavity Surface Emitting Lasers (VECSELs) IX

Publisher: SPIE, IEEE

Editor: Keller, U.

Article number: 109010D

ISBN (Electronic): 9781510624443

#### Publication series

Name: Proceedings of SPIE - The International Society for Optical Engineering

Volume: 10901

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: AlGaAs, DBR-free, MECSEL, Near infra-red, Thermal management, Thermal resistance, VECSEL

DOIs:

10.1117/12.2512111

#### Bibliographical note

INT=phys,"Rajala, Patrik"

jufoid=71479

Source: Scopus

Source ID: 85066635597

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### 1.55- $\mu\text{m}$ wavelength wafer-fused OP-VECSELs in flip-chip configuration

Optically-pumped vertical external cavity surface emitting lasers (VECSELs) based on flip-chip gain mirrors emitting at the 1.55- $\mu\text{m}$  wavelength range are reported. The gain mirrors employ wafer-fused InAlGaAs/InP quantum well heterostructures and GaAs/AlAs distributed Bragg reflectors, which were incorporated in a linear and a V-cavity configurations. A maximum output power of 3.65 W was achieved for a heatsink temperature of 11°C and employing a 2.2% output coupler. The laser exhibited circular beam profiles for the full emission power range. The demonstration represents more than 10-fold increase of the output power compared to state-of-the-art flip-chip VECSELs previously demonstrated at the 1.55- $\mu\text{m}$  wavelength range, and opens a new perspective for developing practical VECSEL-based laser system for applications such as LIDAR, spectroscopy, communications and distributed sensing.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, CRPP, LakeDiamond SA

Contributors: Mereuta, A., Nechay, K., Caliman, A., Suruceanu, G., Gallo, P., Guina, M., Kapon, E.

Publication date: 2019

#### Host publication information

Title of host publication: Vertical External Cavity Surface Emitting Lasers (VECSELs) IX

Publisher: SPIE, IEEE

Editor: Keller, U.

Article number: 1090103

ISBN (Electronic): 9781510624443

#### Publication series

Name: Proceedings of SPIE - The International Society for Optical Engineering

Volume: 10901

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: Optically-pumped VECSELs, Semiconductor lasers, Wafer-Fusion

DOIs:

10.1117/12.2508342

#### Bibliographical note

jufoid=71479

Source: Scopus

Source ID: 85066636665

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **From monolithic systems to microservices: A decomposition framework based on process mining**

Decomposition is one of the most complex tasks during the migration from monolithic systems to microservices, generally performed manually, based on the experience of the software architects. In this work, we propose a 6-step framework to reduce the subjectivity of the decomposition process. The framework provides software architects with a set of decomposition options, together with a set of measures to evaluate and compare their quality. The decomposition options are identified based on the independent execution traces of the system by means of the application of a process-mining tool to the log traces collected at runtime. We validated the process, in an industrial project, by comparing the proposed decomposition options with the one proposed by the software architect that manually analyzed the system. The application of our framework allowed the company to identify issues in their software that the architect did not spot manually, and to discover more suitable decomposition options that the architect did not consider. The framework could be very useful also in other companies to improve the quality of the decomposition of any monolithic system, identifying different decomposition strategies and reducing the subjectivity of the decomposition process. Moreover, researchers could extend our approach increasing the support and further automating the decomposition support.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Computing Sciences, TASE - Tampere Software Engineering Research Group

Contributors: Taibi, D., Systä, K.

Number of pages: 12

Pages: 153-164

Publication date: 2019

#### **Host publication information**

Title of host publication: CLOSER 2019 - Proceedings of the 9th International Conference on Cloud Computing and Services Science

Publisher: SCITEPRESS

Editors: Ferguson, D., Munoz, V. M., Helfert, M., Pahl, C.

ISBN (Electronic): 9789897583650

ASJC Scopus subject areas: Computer Science (miscellaneous), Computer Science Applications

Keywords: Cloud-native, Microservice decomposition, Microservice migration, Microservice slicing, Microservices

DOIs:

10.5220/0007755901530164

Source: Scopus

Source ID: 85067463647

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **405-nm pumped Ce<sup>3+</sup>-doped silica fiber for broadband fluorescence from cyan to red**

A pure Ce-doped silica fiber is fabricated using modified chemical vapor deposition (MCVD) technique. Fluorescence characteristics of a Ce-doped silica fiber are experimentally investigated with continuous wave pumping from 440 nm to 405 nm. Best pump absorption and broad fluorescence spectrum is observed for ~ 405 nm laser. Next, the detailed analysis of spectral response as a function of pump power and fiber length is performed. It is observed that a-10dB spectral width of ~ 280 nm can be easily achieved with different combinations of the fiber length and pump power. Lastly, we present, for the first time to the best of our knowledge, a broadband fluorescence spectrum with-10dB spectral width of 301 nm, spanning from ~ 517.36 nm to ~ 818 nm, from such fibers with non-UV pump lasers.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, Aston University, Fiber Optics Research Center of the Russian Academy of Sciences, Russian Academy of Sciences

Contributors: Yadav, A., Chichkov, N. B., Gumenyuk, R., Zhrebtsov, E., Melkumov, M. A., Yashkov, M. V., Dianov, E. M., Rafailov, E. U.

Publication date: 2019

#### **Host publication information**

Title of host publication: Optical Components and Materials XVI

Publisher: SPIE, IEEE

Editors: Dignonnet, M. J. F., Jiang, S.

Article number: 1091406

ISBN (Electronic): 9781510624702

### Publication series

Name: Proceedings of SPIE - The International Society for Optical Engineering

Volume: 10914

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: Broadband spectrum, Ce-doped fiber, Ce-ion, Rare earth doped

DOIs:

10.1117/12.2509599

### Bibliographical note

jufoid=71479

Source: Scopus

Source ID: 85066046508

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Observation of local electroluminescent cooling and identifying the remaining challenges

The cooling of a light emitting diode (LED) by photons carrying out more energy than was used to electrically bias the device, has been predicted decades ago.<sup>1, 2</sup> While this effect, known as electroluminescent cooling (ELC), may allow e.g. fabricating thermophotonic heat pumps (THP) providing higher efficiencies than the existing solid state coolers,<sup>3</sup> ELC at powers sufficient for practical applications is still not demonstrated. To study high-power ELC we use double diode structures (DDSs), which consist of a double heterojunction (DHJ) LED and a photodiode (PD) grown within a single technological process and, thus, enclosed in a cavity with a homogeneous refractive index.<sup>4, 5</sup> The presence of the PD in the structure allows to more directly probe the efficiency of the LED, without the need for light extraction from the system, reducing undesirable losses. Our analysis of experimentally measured I - V curves for both the LED and the PD suggests that the local efficiency of the high-performance LEDs we have fabricated is approximately 110%, exceeding unity over a wide range of injection current densities of up to about 100A/cm<sup>2</sup>. At present the efficiency of the full DDS, however, still falls short of unity, not allowing direct evidence of the extraction of thermal energy from the LED. Here we review our previous studies of DDS for high-power EL cooling and discuss in more detail the remaining bottlenecks for demonstrating high-power ELC in the DDS context: the LED surface states, resistive and photodetection losses. In particular we report our first surface passivation measurements. Further optimization therefore mainly involves reducing the influence of the surface states, e.g. using more efficient surface passivation techniques and optimizing the PD. This combined with the optimization of the DDS layer thicknesses and contact metallization schemes is expected to finally allow purely experimental observation of high-power ELC.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, Aalto University

Contributors: Radevici, I., Sadi, T., Tripurari, T., Tiira, J., Ranta, S., Tukiainen, A., Guina, M., Oksanen, J.

Publication date: 2019

### Host publication information

Title of host publication: Photonic Heat Engines : Science and Applications

Publisher: SPIE, IEEE

Editors: Seletskiy, D. V., Epstein, R. I., Sheik-Bahae, M.

Article number: 109360A

ISBN (Electronic): 9781510625143

### Publication series

Name: Proceedings of SPIE - The International Society for Optical Engineering

Volume: 10936

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: Double diode structures, Electroluminescent cooling, III-V semiconductors, Quantum efficiency, Surface states

DOIs:

10.1117/12.2505814

### Bibliographical note

jufoid=71479

Source: Scopus

Source ID: 85065604697

### **1.3 $\mu$ m U-bend traveling wave SOA devices for high efficiency coupling to silicon photonics**

We present a U-bend design for traveling wave III-V gain devices, such as semiconductor optical amplifiers and laser diodes. The design greatly simplifies the butt-coupling between the III-V chip and silicon-on-insulator photonic circuit by bringing the I/O ports on one facet. This removes the need for precise dimension control otherwise required for 2-side coupling, therefore increasing the yield of mounted devices towards 100%. The design, fabrication and characterization of the U-bend device based on Euler bend geometry is presented. The losses for a bend with a minimum bending radius of 83  $\mu$ m are 1.1 dB. In addition, we present an analysis comparing the yield and coupling losses of the traditionally cleaved devices with the results that the Euler bend approach enable, with the final conclusion that the yield is improved by several times while the losses are decreased by several dB.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, VTT Technical Research Centre of Finland

Contributors: Viheriälä, J., Tuorila, H., Zia, N., Cherchi, M., Aalto, T., Guina, M.

Publication date: 2019

#### **Host publication information**

Title of host publication: Silicon Photonics XIV

Publisher: SPIE, IEEE

Editors: Reed, G. T., Knights, A. P.

Article number: 109230E

ISBN (Electronic): 9781510624887

#### **Publication series**

Name: Proceedings of SPIE - The International Society for Optical Engineering

Volume: 10923

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: Coupling losses, Hybrid integration, III-V, Semiconductor optical amplifiers, Silicon-on-insulator

DOIs:

10.1117/12.2505935

#### **Bibliographical note**

jufoid=71479

Source: Scopus

Source ID: 85065404814

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Dynamics of value in technology inspired value co-creation: Case in homecare value network**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial Engineering and Management, Research group: Cost Management Center

Contributors: Tiitola, V., Korhonen, T., Laine, T., Lyly-Yrjänäinen, J.

Publication date: 2019

#### **Host publication information**

Title of host publication: 14th IFKAD 2019 Proceedings : 5-7 June 2019, Matera, Italy

Publisher: IKAM Centro Studi & Ricerche

ISBN (Electronic): 978-88-96687-12-3

#### **Publication series**

Name: PROCEEDINGS IFKAD

ISSN (Electronic): 2280-787X

URLs:

<https://www.ifkad.org/previous-editions/ifkad-2019/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Smartphone teleoperation for self-balancing telepresence robots**

Self-balancing mobile platforms have recently been adopted in many applications thanks to their light-weight and slim build. However, inherent instability in their behaviour makes both manual and autonomous operation more challenging as compared to traditional self-standing platforms. In this work, we experimentally evaluate three teleoperation user interface approaches to remotely control a self-balancing telepresence platform: 1) touchscreen button user interface, 2) tilt user interface and 3) hybrid touchscreen-tilt user interface. We provide evaluation in quantitative terms based on user trajectories and recorded control data, and qualitative findings from user surveys. Both quantitative and qualitative results support our finding that the hybrid user interface (a speed slider with tilt turn) is a suitable approach for smartphone-based teleoperation of self-balancing telepresence robots. We also introduce a client-server based multi-user telepresence architecture using open source tools.

#### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Computing Sciences  
Contributors: Ainasoja, A. E., Pertuz, S., Kämäräinen, J.  
Number of pages: 8  
Pages: 561-568  
Publication date: 2019

#### **Host publication information**

Title of host publication: VISIGRAPP 2019 - Proceedings of the 14th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications  
Publisher: SCITEPRESS  
Editors: Kerren, A., Hurter, C., Braz, J.  
ISBN (Electronic): 9789897583544  
ASJC Scopus subject areas: Computer Science Applications, Computer Vision and Pattern Recognition, Computer Graphics and Computer-Aided Design  
Keywords: Teleoperation, Telepresence, User Interface  
Electronic versions:  
VISAPP\_2019\_199  
DOIs:  
10.5220/0007406405610568  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201908282038>  
Source: Scopus  
Source ID: 85068231086  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Revisiting gray pixel for statistical illumination estimation**

We present a statistical color constancy method that relies on novel gray pixel detection and mean shift clustering. The method, called Mean Shifted Grey Pixel – MSGP, is based on the observation: true-gray pixels are aligned towards one single direction. Our solution is compact, easy to compute and requires no training. Experiments on two real-world benchmarks show that the proposed approach outperforms state-of-the-art methods in the camera-agnostic scenario. In the setting where the camera is known, MSGP outperforms all statistical methods.

#### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Computing Sciences, Czech Technical University in Prague, Intel Finland  
Contributors: Qian, Y., Pertuz, S., Nikkanen, J., Kämäräinen, J., Matas, J.  
Number of pages: 11  
Pages: 36-46  
Publication date: 2019

#### **Host publication information**

Title of host publication: VISIGRAPP 2019 - Proceedings of the 14th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications  
Publisher: SCITEPRESS  
Editors: Kerren, A., Hurter, C., Braz, J.  
ISBN (Electronic): 9789897583544  
ASJC Scopus subject areas: Computer Science Applications, Computer Vision and Pattern Recognition, Computer Graphics and Computer-Aided Design

Keywords: Color Constancy, Gray Pixel, Illumination Estimation

Electronic versions:

VISAPP\_2019\_201

DOIs:

10.5220/0007406900360046

URLs:

<http://urn.fi/URN:NBN:fi:tty-201908282042>

Source: Scopus

Source ID: 85068208950

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Benchmarking of several disparity estimation algorithms for light field processing**

A number of high-quality depth imaged-based rendering (DIBR) pipelines have been developed to reconstruct a 3D scene from several images taken from known camera viewpoints. Due to the specific limitations of each technique, their output is prone to artifacts. Therefore, the quality cannot be ensured. To improve the quality of the most critical and challenging image areas, an exhaustive comparison is required. In this paper, we consider three questions of benchmarking the quality performance of eight DIBR techniques on light fields: First, how does the density of original input views affect the quality of the rendered novel views? Second, how does disparity range between adjacent input views impact the quality? Third, how does each technique behave for different object properties? We compared and evaluated the results visually as well as quantitatively (PSNR, SSIM, AD, and VDP2). The results show some techniques outperform others in different disparity ranges. The results also indicate using more views not necessarily results in visually higher quality for all critical image areas. Finally, we have shown a comparison for different scene's complexity such as non-Lambertian objects.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Computing Sciences, Moving Picture Technologies

Contributors: Zakeri, F. S., Bätz, M., Jaschke, T., Keinert, J., Chuchvara, A.

Publication date: 2019

### **Host publication information**

Title of host publication: Fourteenth International Conference on Quality Control by Artificial Vision

Publisher: SPIE, IEEE

Editors: Bazeille, S., Verrier, N., Cudel, C.

Article number: 111721C

ISBN (Electronic): 9781510630536

### **Publication series**

Name: Proceedings of SPIE - The International Society for Optical Engineering

Volume: 11172

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: Depth image-based rendering, Disparity estimation, Quality evaluation

DOIs:

10.1117/12.2521747

### **Bibliographical note**

jufoid=71479

Source: Scopus

Source ID: 85070208910

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Action and power efficiency in self-organization: The case for growth efficiency as a cellular objective in escherichia coli**

Complex systems of different nature self-organize using common mechanisms. One of those is increase of their efficiency. The level of organization of complex systems of different nature can be measured as increased efficiency of the product of time and energy for an event, which is the amount of physical action consumed by it. Here we apply a method developed in physics to study the efficiency of biological systems. The identification of cellular objectives is one of the central topics in the research of microbial metabolic networks. In particular, the information about a cellular objective is needed in flux balance analysis which is a commonly used constrained-based metabolic network analysis method for the prediction of cellular phenotypes. The cellular objective may vary depending on the organism and its growth conditions. It is probable that nutritionally scarce conditions are very common in the nature, and, in order to survive in those conditions, cells exhibit various highly efficient nutrient-processing systems like enzymes. In this study, we explore the efficiency of a metabolic network in transformation of substrates to new biomass, and we introduce a new objective function simulating growth

efficiency. We are searching for general principles of self-organization across systems of different nature. The objective of increasing efficiency of physical action has been identified previously as driving systems toward higher levels of self-organization. The flow agents in those networks are driven toward their natural state of motion, which is governed by the principle of least action in physics. We connect this to a power efficiency principle. Systems structure themselves in a way to decrease the average amount of action or power per one event in the system. In this particular example, action efficiency is examined in the case of growth efficiency of *E. coli*. We derive the expression for growth efficiency as a special case of action (power) efficiency to justify it through first principles in physics. Growth efficiency as a cellular objective of *E. coli* coincides with previous research on complex systems and is justified by first principles in physics. It is expected and confirmed outcome of this work. We examined the properties of growth efficiency using a metabolic model for *Escherichia coli*. We found that the maximal growth efficiency is obtained at a finite nutrient uptake rate. The rate is substrate dependent and it typically does not exceed 20 mmol/h/gDW. We further examined whether the maximal growth efficiency could serve as a cellular objective function in metabolic network analysis and found that cellular growth in batch cultivation can be predicted reasonably well under this assumption. The fit to experimental data was found slightly better than with the commonly used objective function of maximal growth rate. Based on our results, we suggest that the maximal growth efficiency can be considered a plausible optimization criterion in metabolic modeling for *E. coli*. In the future, it would be interesting to study growth efficiency as an objective also in other cellular systems and under different cultivation conditions.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: BioMediTech, Wireless Innovation Laboratory at Worcester Polytechnic Institute, Assumption College, Tufts University, Complex Systems Center, University of Vermont

Contributors: Georgiev, G. Y., Aho, T., Kesseli, J., Yli-Harja, O., Kauffman, S. A.

Number of pages: 16

Pages: 229-244

Publication date: 2019

### Host publication information

Title of host publication: Evolution, Development and Complexity - Multiscale Evolutionary Models of Complex Adaptive Systems

Publisher: Springer

Editors: Flores Martinez, C. L., Georgiev, G. Y., Smart, J. M., Price, M. E.

ISBN (Print): 9783030000745

### Publication series

Name: Springer Proceedings in Complexity

ISSN (Print): 2213-8684

ISSN (Electronic): 2213-8692

ASJC Scopus subject areas: Applied Mathematics, Modelling and Simulation, Computer Science Applications

Keywords: Action efficiency, Constraint-based modeling, Metabolism, Microorganism, Principle of least action

DOIs:

10.1007/978-3-030-00075-2\_8

### Bibliographical note

jufoid=84878

Source: Scopus

Source ID: 85071889407

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Performance Enhancement Of Optimized Link State Routing Protocol For Health Care Applications In Wireless Body Area Networks

Wireless Body Area Networks (WBAN) refers to the network of wearable sensor devices on a human body. The data gathered from the devices are sent to the server to take some action during an emergency. The collected data has to be successfully routed to reach the destination for an health care applications in WBAN. Hence selecting the routing protocol plays an important role in WBAN. Several researchers have proposed many routing protocols for WBAN. In this work, a novel proactive routing protocol called Energy Aware Power Save Mode Link State is proposed that modifies the existing Optimized Link State Routing protocol. The mathematical model is defined to select the best multi point relay node in a network that considers the power save mode state. The experiment is conducted using network simulator NS-3 and the result shows the substantial network performance metrics improvement in the proposed model compared to the existing.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering

Contributors: Chetan Kumar, V., Shiva Prakash, S. P., Balandin, S.

Number of pages: 9  
Pages: 195-203  
Publication date: Nov 2018

#### Host publication information

Title of host publication: 2018 23rd Conference of Open Innovations Association (FRUCT)  
Publisher: IEEE  
ISBN (Print): 978-1-5386-6943-3  
ISBN (Electronic): 978-9-5268-6536-2  
Keywords: Body area networks, Routing protocols, Wireless communication, Peer-to-peer computing, Quality of service, Routing  
DOIs:  
10.23919/FRUCT.2018.8588070  
Source: Bibtex  
Source ID: urn:c178e5ef1e338cad17f7c536b89f7cb3  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### The Effects of Product Line Length on Firm Performance

What products to offer represents one of the most important strategic choices a firm has to make in order to survive in competitive environments. Decisions about the length and breadth of a firm's product line are difficult but vital to its success. Despite this, the performance effects of product line length are a topic of continuing discussion in the academia. There are also multiple ways to define both product line length and breadth, further hindering the analysis and comparison of the results. This study defines both product line length and breadth, and distinguishes them as separate dimensions of a firm's product portfolio. Additionally, the relationship between product line length and firm performance is analyzed through customer evaluations. The study is set in the digital camera industry, focusing on the new product introductions into the compact product category during 2000–2014. Our results offer indication that there exists an inverted U-shaped relationship between product line length and firm performance.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Industrial and Information Management, Research group: Center for Innovation and Technology Research  
Contributors: Kirjavainen, J., Mäkinen, S., Sommarberg, M.  
Number of pages: 5  
Publication date: 8 Oct 2018

#### Host publication information

Title of host publication: 2018 Portland International Conference on Management of Engineering and Technology (PICMET)  
Publisher: IEEE  
ISBN (Electronic): 978-1-890843-37-3  
Keywords: Digital cameras , Industries , Length measurement , Lenses , Time measurement , Mirrors  
DOIs:  
10.23919/PICMET.2018.8481780

#### Bibliographical note

jufoid=9093  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Social capital characteristics in RD project networks

Network research has multiple approaches that offer knowledge related to multiple network types. This article identifies and discusses social capital characteristics in the context of government-funded RD project networks. Previous literature on this context has typically focused on collaboration between universities and firms while our interest is solely on interfirm relationships. Secondly, the previous literature on interfirm collaboration concerns typically other types of networks such as strategic alliances. We argue, that to understand the dynamics of inter firm collaboration in RD project networks, the research needs to be conducted in coherent environment. Data for this qualitative research was collected by interviewing 18 firm representatives who had experience on participating government-funded RD projects. We recognized social capital characteristics in RD projects and organized these findings under structural, cognitive and relational dimensions of social capital. Results indicate that project networks' social capital characteristics differ in many parts from strategic alliances and thus support our argument. The results can be exploited by project coordinators, innovation officers and project network members to facilitate the interfirm collaboration in RD project networks.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication



Organisations: Mechanical Engineering and Industrial Systems, Research area: Manufacturing and Automation  
Contributors: Majuri, M., Lanz, M.  
Publication date: 4 Oct 2018

#### Host publication information

Title of host publication: 2018 Portland International Conference on Management of Engineering and Technology (PICMET)

Publisher: IEEE

Article number: 8481775

ISBN (Electronic): 9781890843373

ASJC Scopus subject areas: Strategy and Management, Communication, Engineering (miscellaneous), Management of Technology and Innovation, Organizational Behavior and Human Resource Management, Computer Networks and Communications, Decision Sciences (miscellaneous)

DOIs:

10.23919/PICMET.2018.8481775

#### Bibliographical note

jufoid=9093

Source: Scopus

Source ID: 85056486979

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Technopreneurial Characteristics Rising from the Ashes of Creative Destruction

This paper uses the grounded theory building method to investigate the differences and similarities in the evolutionary paths of three entrepreneurial ventures. Theory-based reasoning was used to select cases representing different technopreneurial business models, namely product, expert service, and integrated product-service business models. Our cases emerged from a disrupted global technology corporation and they represent the economic activity emerging from classical creative destruction. We investigate the evolutionary paths of these ventures from their start-up by employing the resource-based view (RBV) approach to determine the critical change points and watershed events that guide the path of the cases. With these analyses, we are able to differentiate the performance differentials and evolutionary trajectories of the cases. The cases suggest that while the strength of the original path is strong it is possible to change the course despite path dependencies. We outline the mechanisms that facilitated these transitions (e.g., finding a suitable equity fund as a catalyst to make the change). Hence, we find that entrepreneurial ventures are not as path dependent as previous studies suggest; rather, there is managerial discretion to change the evolutionary trajectories. Our study suggests that the capabilities acquired over a long period of time in a global technology corporation contribute to the ability to change the path. We discuss the theoretical and practical implications of the critical decision points during the evolutionary trajectories of ventures.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Center for Innovation and Technology Research

Contributors: Sommarberg, M., Mäkinen, S.

Number of pages: 10

Pages: 1-10

Publication date: 1 Oct 2018

#### Host publication information

Title of host publication: Proceedings in 2018 Portland International Conference in Management and Engineering (PICMET) : (PICMET) 19-23 August 2018

Publisher: IEEE

ISBN (Electronic): 978-1-890843-37-3

DOIs:

10.23919/PICMET.2018.8481846

#### Bibliographical note

jufoid=9093

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Analysis of User Exploration Patterns during Scene Cuts in Omnidirectional Videos

Omnidirectional video can be comprised of several scenes joined together. A scene in a video can change within the same semantic content due to switching to a different camera position (e.g., in a multi-camera sport event), referred to as intra-scene transition; in other situations, a scene in a video can change between different semantic content, referred to as inter-scene transition (e.g., a scene cut from a movie). — In this paper an attempt is made to 1) find the user exploration behavior in terms of the exploration range, angular speed and acceleration metrics; 2) Investigate whether there is any exploration behavioral change in the watching patterns between intra- and inter-scene transitions. — We find that there is

an increase in the exploratory behavior for all the above-mentioned metrics, and show that there is a delay (reaction time) between the scene transition and the start of the exploration. Finally, we also show that the exploratory behavior is higher in inter-scene transitions compared to intra-scene transitions.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Research group: Multimedia Research Group - MRG, Nokia Technologies

Contributors: Monakhov, D., Naik, D., Curcio, I. D. D., Toukoma, H.

Number of pages: 20

Publication date: Oct 2018

#### Host publication information

Title of host publication: SMPTE 2018

Publisher: SMPTE

ISBN (Print): 978-1-61482-960-7

Keywords: Omnidirectional video, 360 Degrees video, Exploration range, Scene transitions, Watching patterns, Scene cuts, Viewport dependent streaming

DOIs:

10.5594/M001845

Source: Bibtex

Source ID: urn:c98a31d3ee60d03894118df511ce8868

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Long-term monitoring of acute wound healing from beneath the primary wound dressings

Our group has developed a quasimonopolar bioimpedance measurement-based method and a measurement system to determine the status of wound healing. So far, we have shown that the bioimpedance method is a prospective tool for assessment of wound healing by monitoring the healing of both acute wounds and venous ulcers at discrete time points. The objective of this study was to demonstrate that the method is capable for monitoring wound healing also long-term while the wound is covered by the primary dressings. For this purpose we arranged a follow-up study of a single acute wound. The purpose-built multi-electrode dressing was applied on the wound and left under the primary dressings until the complete re-epithelization was achieved. The bioimpedance of the wound and surrounding skin area was measured regularly during a 120 hours study. Based on the results, we can confirm that the method applies for long-term monitoring of acute wound healing without necessity to remove the primary dressings.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Physiological Measurement Systems and Methods Group, BioMediTech, CutoSense Ltd.

Contributors: Kekonen, A., Bergelin, M., Eriksson, J., Vesa, M., Johansson, M., Viik, J.

Number of pages: 4

Publication date: Oct 2018

#### Host publication information

Title of host publication: 2018 16th Biennial Baltic Electronics Conference (BEC)

Publisher: IEEE

ISBN (Print): 978-1-5386-7313-3

ISBN (Electronic): 978-1-5386-7312-6

Keywords: Electrodes, Wounds, Impedance, Skin, Biomedical measurement, Monitoring, Bioimpedance, bioimpedance beneath dressing, healing, longterm wound monitoring, multi-electrode

DOIs:

10.1109/BEC.2018.8600956

Source: Bibtex

Source ID: urn:054660b869151d1efd2f9613e80b4431

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Glove-integrated slotted patch antenna for wearable UHF RFID reader

We present a glove-integrated slotted patch antenna for a wearable Ultra High Frequency Radio Identification Technology (UHF RFID) reader operating at 866

MHz. We tested the prototype antenna made of copper foil adhered on low-permittivity Ethylene Propylene Diene Monomer (EPDM) foam material having the thickness of 4 mm. To characterize the antenna, we tested it wirelessly in communication with a common dipole type RFID tag to estimate its realized gain, radiation pattern and maximum tag read range it provides. We also analyzed the effects of variable separation between the antenna and the body to confirm stable operation required by the application. The results showed that the antenna feasible for the work glove applications

providing the read range  
up to 360 cm with the reader's output power of 28.4 dBm.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Wireless Identification and Sensing Systems Research Group, BioMediTech

Contributors: Ahmed, S., Musfequr Rehman, S. M., Ukkonen, L., Björninen, T.

Number of pages: 4

Publication date: 26 Sep 2018

#### Host publication information

Title of host publication: 2018 IEEE International Conference on RFID Technology & Application (RFID-TA)

Publisher: IEEE

ISBN (Electronic): 978-1-5386-5057-8

Electronic versions:

rfidta

DOIs:

10.1109/RFID-TA.2018.8552817

URLs:

<http://urn.fi/URN:NBN:fi:tty-201812192866>

#### Bibliographical note

INT=TUT-BMT,"Musfequr Rehman, S. M."

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### RF energy harvesting system with RFID-enabled charge storage monitoring

Radio frequency (RF) energy scavenging is a compelling approach to energize the low-power wireless devices. We present an energy harvesting system consists of a low-power RF switch circuitry and a passive UHF RFID tag. When the voltage at the storage capacitor terminals exceeds 0.58 V, RF switch connects the UHF RFID microchip to a dipole-type tag antenna. This way, an RFID reader can detect the charge storage level wirelessly with minimal power consumption at the harvester. In this paper, we detail the development of the system and present results from both simulations and measurement. Overall, we were able to achieve 0.58 V at the storage capacitor and detect the storage level indicator tag at the distance of 5.1 m in an experiment where regular 8.7 dBi patch antennas were connected to the harvester input and output of an RFID reader emitting 2.5 W EIRP.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Wireless Identification and Sensing Systems Research Group, Research group: Wireless Identification and Sensing Systems Research Group

Contributors: Pournoori, N., Khan, W., Ukkonen, L., Björninen, T.

Number of pages: 4

Publication date: 26 Sep 2018

#### Host publication information

Title of host publication: 2018 IEEE International Conference on RFID Technology & Application (RFID-TA)

Publisher: IEEE

ISBN (Electronic): 978-1-5386-5057-8

Electronic versions:

RFID paper

DOIs:

10.1109/RFID-TA.2018.8552826

URLs:

<http://urn.fi/URN:NBN:fi:tty-201812192865>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Referenced backscattering compression level indicator based on passive UHF RFID tags

We establish a passive UHF RFID tag as a sensor with a referenced readout to compression. We introduce the sensor tag design, which is based on a two-part split ring resonator antenna, and present the compression sensor platform with a reference tag. We analyze the achieved wireless measurement results and evaluate the performance of the compression sensing platform. Based on these initial measurements, passive RFID-based sensors could provide a maintenance-free wirelessly readable option for compression sensing, for example for structural health monitoring.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Wireless Identification and Sensing Systems Research Group, BioMediTech

Contributors: Qureshi, S., Björninen, T., Virkki, J.

Number of pages: 3

Publication date: 26 Sep 2018

### Host publication information

Title of host publication: 2018 IEEE International Conference on RFID Technology & Application (RFID-TA)

Publisher: IEEE

ISBN (Electronic): 978-1-5386-5057-8

DOIs:

10.1109/RFID-TA.2018.8552830

### Bibliographical note

JUFOID=72031

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Constrained Long-Horizon Direct Model Predictive Control for Synchronous Reluctance Motor Drives

A finite control set model predictive control strategy for the control of the stator currents of a synchronous reluctance motor driven by a three-level neutral point clamped inverter is presented in this paper. The presented algorithm minimizes the stator current distortions while operating the drive system at switching frequencies of a few hundred Hertz. Moreover, the power electronic converter is protected by overcurrents and/or overvoltages owing to a hard constraint imposed on the stator currents. To efficiently solve the underlying integer nonlinear optimization problem a sphere decoding algorithm serves as optimizer. To this end, a numerical calculation of the unconstrained solution of the optimization problem is proposed, along with modifications in the algorithm proposed in [1] so as to meet the above-mentioned control objectives. Simulation results show the effectiveness of the proposed control algorithm.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electrical Energy Engineering, Research group: Power electronics, Università degli Studi di Padova, Italy, Technische Universität München

Contributors: Ortombina, L., Liegmann, E., Karamanakos, P., Tinazzi, F., Zigliotto, M., Kennel, R.

Number of pages: 8

Publication date: 10 Sep 2018

### Host publication information

Title of host publication: 2018 IEEE 19th Workshop on Control and Modeling for Power Electronics, COMPEL 2018

Publisher: IEEE

Article number: 8460173

ISBN (Print): 9781538655412

ASJC Scopus subject areas: Modelling and Simulation, Energy Engineering and Power Technology, Electrical and Electronic Engineering, Control and Optimization

DOIs:

10.1109/COMPEL.2018.8460173

### Bibliographical note

JUFOID=79370

Source: Scopus

Source ID: 85054503298

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### 2D Video Coding of Volumetric Video Data

Due to the increased popularity of augmented and virtual reality experiences, the interest in representing the real world in an immersive fashion has never been higher. Distributing such representations enables users all over the world to freely navigate in never seen before media experiences. Unfortunately, such representations require a large amount of data, not feasible for transmission on today's networks. Thus, efficient compression technologies are in high demand. This paper proposes an approach to compress 3D video data utilizing 2D video coding technology. The proposed solution was developed to address the needs of 'tele-immersive' applications, such as virtual (VR), augmented (AR) or mixed (MR) reality with Six Degrees of Freedom (6DoF) capabilities. Volumetric video data is projected on 2D image planes and compressed using standard 2D video coding solutions. A key benefit of this approach is its compatibility with readily available 2D video coding infrastructure. Furthermore, objective and subjective evaluation shows significant improvement in coding efficiency over reference technology.

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Signal Processing, Nokia Technologies  
Contributors: Schwarz, S., Hannuksela, M. M., Fakour-Sevom, V., Sheikhi-Pour, N.  
Number of pages: 5  
Pages: 61-65  
Publication date: 5 Sep 2018

### Host publication information

Title of host publication: 2018 Picture Coding Symposium, PCS 2018 - Proceedings  
Publisher: IEEE  
Article number: 8456265  
ISBN (Print): 9781538641606  
ASJC Scopus subject areas: Signal Processing, Media Technology  
DOIs:  
10.1109/PCS.2018.8456265

### Bibliographical note

INT=sgn,"Sheikhi-Pour, Nahid"  
Source: Scopus  
Source ID: 85053915056  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Web User Interface Implementation Technologies: An Underview

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Pervasive Computing, Research area: Software engineering, University of Lugano (USI), Università della Svizzera Italiana, Nokia Technologies, University of Helsinki  
Contributors: Taivalsaari, A., Mikkonen, T., Systä, K., Pautasso, C.  
Number of pages: 10  
Pages: 127-136  
Publication date: 5 Sep 2018

### Host publication information

Title of host publication: 14th International Conference on Web Information Systems and Technologies  
Publisher: SCITEPRESS  
ISBN (Print): 978-989-758-324-7  
DOIs:  
10.5220/0006885401270136

### Bibliographical note

EXT="Taivalsaari, Antero"  
EXT="Mikkonen, Tommi"  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Multi-site delamination analysis using virtual crack closure technique for a composite aircraft wing flap

In this study, we investigate the application of virtual crack closure technique (VCCT) for a multi-site delamination damage in the F-18 Hornet fighter aircraft's wing flap. The work focuses on the interaction between multiple delamination sites at different ply interfaces. The effects of numerical analysis parameters, such as energy release rate tolerance, on the criticality of the delamination and on the delamination growth are also studied.

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Materials Science, Research group: Plastics and Elastomer Technology, Aalto University  
Contributors: Jokinen, J., Kanerva, M., Saarela, O.  
Publication date: Sep 2018

### Host publication information

Title of host publication: 31st Congress of the International Council of the Aeronautical Sciences (Proceedings) : Belo Horizonte, Brazil September 9-14, 2018  
Publisher: ICAS Press

ISBN (Electronic): 978-3-932182-88-4

Keywords: Multi-site damage, Finite element analysis, Fighter aircraft, Flap

URLs:

<https://www.icas.org/>

[https://www.icas.org/Papers\\_previous\\_congresses.html](https://www.icas.org/Papers_previous_congresses.html)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Fabrication and Practical Evaluation of Glove-integrated Passive UHF RFID Tags**

Passive RFID-based technology is a convincing approach to achieve versatile energy- and cost-efficient wireless platforms for future wearable applications. In this paper, we present passive UHF RFID tags integrated into normal work gloves for wearable RFID applications. We introduce embroidery as a new efficient antenna fabrication method for glove-integrated tags as well as establish reference glove-tag antennas from electro-textiles and copper tape. The performance of the three types of glove-tags is evaluated on a male test subject in an anechoic room and in an office environment. Based on the wireless measurement results, the read ranges of the embroidered glove-tags were around 1 meter in an anechoic chamber and in an office, when measured near the human body. These results meet the requirements of many practical applications of glove-tags, although the read ranges are shorter than those of the electro-textile and copper tape tags that showed read ranges of 2-2.5 meters. Finally, the developed glove-tags were successfully tested in actual use situations for identification and access control. These results are very promising, especially considering the cost effectiveness of embroidered tag antennas and the easiness of their integration into different types of gloves.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Wireless Identification and Sensing Systems Research Group

Contributors: Chen, X., He, H., Ukkonen, L., Virkki, J., Xu, J., Wang, T., Cheng, L.

Number of pages: 5

Publication date: Sep 2018

#### **Host publication information**

Title of host publication: 2018 IEEE International Conference on RFID Technology Application (RFID-TA)

Publisher: IEEE

ISBN (Print): 978-1-5386-5058-5

ISBN (Electronic): 978-1-5386-5057-8

Keywords: anechoic chambers (electromagnetic), radiofrequency identification, textile products, UHF antennas, wearable antennas, passive RFID-based technology, cost-efficient wireless platforms, wearable RFID applications, glove-integrated tags, electro-textile, embroidered glove-tags, practical applications, copper tape tags, embroidered tag antennas, wireless measurement, glove-integrated passive UHF RFID tags, antenna fabrication method, anechoic chamber, Antennas, Copper, Antenna measurements, Meters, Yarn, Frequency measurement, Radiofrequency identification, RFID, wearable antenna, glove-tag, embroidery electronics, electro-textile antenna

DOIs:

10.1109/RFID-TA.2018.8552814

#### **Bibliographical note**

JUF0ID=72031

Source: Bibtex

Source ID: urn:7ff8bf18c5235d84d462120f1392fdd5

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Comparison of food frequency questionnaire data and shopping records for the assessment of food intake**

Questionnaires are typically used for collecting information describing health behavior in areas such as diet, physical activity and sleep. Utilization of the digital footprint, formed from an individual's unique digital activities, forms a potential new opportunity for describing lifestyle and health-related behavior. We studied if passively collected shopping data describes food intake when compared to food frequency questionnaire (FFQ) data providing information on food and beverage consumption. For 4 out of 21 food groups the results were comparable. Shopping information from only one department store chain gives only a partial picture of the food consumption and differing family sizes add noise to the estimate. If the whole digital footprint would be available, including detailed product-level shopping information from all stores and restaurants, the food intake could probably be estimated more accurately and applied e.g. in personalized coaching.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Faculty of Biomedical Sciences and Engineering, Tampere University of Technology, Institute for Molecular Medicine, FIMM, HiLIFE, University of Helsinki

Contributors: Kallonen, A., Nieminen, H., Das, S., Sallinen, R.

Pages: 25-30

Publication date: 27 Aug 2018

### Host publication information

Title of host publication: Proceedings of Seventh International Conference on Well-Being in the Information Society: Fighting Inequalities (WIS 2018)

ISBN (Electronic): 978-952-12-3727-0

### Publication series

Name: TUCS Lecture Notes

Volume: 28

ISSN (Electronic): 1797-8831

ASJC Scopus subject areas: Molecular Medicine

Keywords: Food intake assessment, shopping data, food frequency questionnaire, digital footprint

URLs:

<http://urn.fi/URN:ISBN:978-952-12-3727-0>

### Bibliographical note

INT=TUT-BMT,"Das, Soumya"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Model-based cosimulation for industrial wireless networks

Wireless communications technology has the potential to provide major benefits in lowering the cost and increasing the efficiency of factory automation (FA) systems. However, design of FA systems that employ wireless networks involves stringent constraints on real-time performance and reliability, and requires the assessment of and experimentation with complex interactions among process control, factory topology construction (layout and connectivity of subsystems, such as machines, rails, etc.), and wireless communication. In this paper, we introduce a novel simulation framework to support such assessment and experimentation in the design of next-generation FA systems. Our simulation framework employs model-based design principles to enhance design reliability, and enable systematic and efficient integration of control, topology, and network modeling aspects. We demonstrate the utility of our framework through a case study that involves topology design and scalability analysis for a large class of FA systems. Our results demonstrate the ability of the proposed framework to provide insights on complex design trade-offs, while the underlying model-based features enhance efficient and reliable system-level integration.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, University of Maryland, National Institute of Standards and Technology, Department of Electrical and Computer Engineering

Contributors: Geng, J., Li, H., Liu, Y., Liu, Y., Kashef, M., Candell, R., Bhattacharyya, S. S.

Number of pages: 10

Pages: 1-10

Publication date: 3 Jul 2018

### Host publication information

Title of host publication: WFCS 2018 - 2018 14th IEEE International Workshop on Factory Communication Systems

Publisher: IEEE

ISBN (Electronic): 9781538610664

ASJC Scopus subject areas: Electrical and Electronic Engineering, Industrial and Manufacturing Engineering

DOIs:

10.1109/WFCS.2018.8402343

### Bibliographical note

jufoid=83653

Source: Scopus

Source ID: 85050017916

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Improved modelling of electric loads for enabling demand response by applying physical and data-driven models: Project Response**

Accurate load and response forecasts are a critical enabler for high demand response penetrations and optimization of responses and market actions. Project RESPONSE studies and develops methods to improve the forecasts. Its objectives are to improve 1) load and response forecast and optimization models based on both data-driven and physical modelling, and their hybrid models, 2) utilization of various data sources such as smart metering data, weather data, measurements from substations etc., and 3) performance criteria of load forecasting. The project applies, develops, compares, and integrates various modelling approaches including partly physical models, machine learning, modern load profiling, autoregressive models, and Kalman-filtering. It also applies non-linear constrained optimization to load responses. This paper gives an overview of the project and the results achieved so far.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electrical Energy Engineering, Research group: Power systems, Research area: Information Systems in Automation, Automation and Hydraulic Engineering, VTT Technical Research Centre of Finland, University of Eastern Finland

Contributors: Koponen, P., Hanninen, S., Mutanen, A., Koskela, J., Rautiainen, A., Järventausta, P., Niska, H., Kolehmainen, M., Koivisto, H.

Number of pages: 6

Pages: 1-6

Publication date: 27 Jun 2018

#### **Host publication information**

Title of host publication: 2018 IEEE International Energy Conference, ENERGYCON 2018

Publisher: IEEE

ISBN (Electronic): 9781538636695

ASJC Scopus subject areas: Artificial Intelligence, Energy Engineering and Power Technology, Control and Optimization

Keywords: Active demand, Forecasting, Hybrid models, Machine learning, Optimization, Physically based models

Electronic versions:

Koponen-ENERGYCON2018-final

DOIs:

10.1109/ENERGYCON.2018.8398794

URLs:

<http://urn.fi/URN:NBN:fi:tty-201808172164>

Source: Scopus

Source ID: 85050244199

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Moving toward integrated solutions in project-based firms: Changes in sales practices**

Effective solution sales is one prerequisite for successful solution business in project-based firms. Little is known about how sales practices should be developed, particularly at the operational level. The purpose of this study is to identify changes in sales practices when firms move towards integrated solutions. A qualitative case study was conducted in two project-based manufacturing firms, using data from interviews with sales and service managers. Five main change categories were identified including changes in the organizational structure, complexity of offering, customer-orientation, sales network and sales routines. The study shows that sales practices should change at all stages of project marketing from detecting the potential projects to finalizing the contract. The study proposes a more extended role for sales and service personnel during project marketing and the project life cycle. The identified changes help project-based firms to develop their sales models and to promote their solution business.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Center for Research on Operations Projects and Services

Contributors: Momeni, K., Martinsuo, M.

Number of pages: 30

Publication date: 21 Jun 2018

#### **Host publication information**

Title of host publication: Proceedings of EURAM18 European Academy of Management conference 2018

Publisher: European Academy of Management, EURAM

ISBN (Electronic): 978-2-9602195-0-0

#### **Publication series**



Name: EURAM conference

ISSN (Print): 2466-7498

Keywords: Project business, solution selling, project sales, project-based firm

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Systematic literature review on customer emotions in social media**

Customers are human beings who express their emotions openly on social media platforms. There is a wealth of social media data that companies can make use of to improve their business decision making and tailor their marketing strategies. In order to benefit from this, organizations need to apply computational methods, which can save time and effort rather than applying traditional consumer research approaches, such as surveys or interviews. The purpose of this study is to investigate existing computational studies on detecting consumer emotions from social media data. We conducted a systematic literature review on articles published in ScienceDirect, IEEE Explore, ACM Digital Library, and Emerald Insight from the period 2009-2017. The aim was to discover how social media data was extracted, how large datasets were used in detecting emotions, the type of computational methods used, and the accuracy of the results obtained from the existing studies. Most of the studies were focused on sentiment analysis and different machine learning algorithms. The computational methods were applied in business decision making and marketing functions. Practical scenarios included emotion detection in customer reviews and sentiment analysis of retail brands. Based on these studies, we have uncovered situations where the results of the analysis are either sufficiently accurate or supportive for decision making. We provide recommendations for organizations and managers on developing their resources to make use of different computational methods for emotion and sentiment detection. Finally, we present the limitations of these methods and provide recommendations for aligning future research studies toward big social data analytics on customer emotions.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Business Ecosystems, Networks and Innovations , Tampere University of Technology, University of Örebro Business School, University of Jyväskylä

Contributors: Madhala, P., Jussila, J., Aramo-Immonen, H., Suominen, A.

Number of pages: 10

Publication date: 21 Jun 2018

### **Host publication information**

Title of host publication: ECSM - Proceedings of the 5th European Conference on Social Media

Place of publication: Limerick, Ireland

Editors: Cunnane, V., Corcoran, N.

ISBN (Print): 978-1-911218-83-8

ISBN (Electronic): 978-1-911218-84-5

Keywords: social media, big data, emotions, consumer behaviour, sentiment analysis

Electronic versions:

ECSM\_2018\_Paper\_Final\_Revised

URLs:

<http://urn.fi/URN:NBN:fi:ju-201807053476>

<http://urn.fi/URN:NBN:fi:tty-201901091039>

### **Bibliographical note**

INT=tj,"Madhala, Prashanth"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Fabrication and reliability evaluation of passive UHF RFID T-shirts**

In this paper, we present textile antennas fabricated for T-shirt RFID applications by cutting from commercially available electro-textile, by sewing with conductive thread, and by 3D printing with stretchable silver ink on a 100 % cotton fabric. The ready tags with attached ICs are coated with a protective stretchable encapsulant. The wireless performance of the T-shirt tags is evaluated initially as well as after seven washing cycles, followed by nine washing-drying cycles in a household washing and drying machines. The initial read ranges of all kinds of tags, when measured on-body, are around 3.5 meters. Based on the reliability testing results, the coating effectively protects the components from cyclic washing and drying.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Wireless Identification and Sensing Systems Research Group, Department of Electronic Engineering, City University of Hong Kong

Contributors: Chen, X., He, H., Ukkonen, L., Virkki, J., Lu, Y., Lam, H.

Number of pages: 4

Pages: 1-4

Publication date: 8 Jun 2018

### Host publication information

Title of host publication: 2018 IEEE International Workshop on Antenna Technology, IWAT2018 - Proceedings

Publisher: IEEE

ISBN (Electronic): 9781538618516

ASJC Scopus subject areas: Instrumentation, Computer Networks and Communications, Electronic, Optical and Magnetic Materials

Keywords: 3D Printing, electro-textiles, embroidery, passive UHF RFID, T-shirts, textiles, washing, wearable electronics

DOIs:

10.1109/IWAT.2018.8379146

### Bibliographical note

jufoid=79362

Source: Scopus

Source ID: 85050037887

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Education on the utilization of secondary materials in earthworks

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Civil Engineering, Aalto University, Aalto University

Contributors: Kuula, P., Leppänen, M., Kolisoja, P., Korkiala-Tanttu, L., Sorvari, J., Gustavsson, H.

Number of pages: 11

Pages: 177-187

Publication date: 6 Jun 2018

#### Host publication information

Title of host publication: Proceedings of the 10th International Conference on the Environmental and Technical Implications of Construction with Alternative Materials : No Gradle no Grave Circular Economy into practice

Publisher: RIL - Finnish Association of Civil Engineers

Editors: Lahtinen, P., Raasakka, V.

ISBN (Electronic): 978-951-758-631-3

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Dual-frequency signal processing architecture for robust and precise positioning applications

Availability of new GPS civil signals L2C and L5 along with existed L1C/A signal and Galileo E1/E5/E6 signals has increased the potential ways to generate linear combination of signals to remove ionosphere errors and improve accuracy in carrier integer ambiguity resolution. Conventionally, a linear combination of dual frequency signals has been used to remove first order ionosphere delays incurred in signal propagation path which is a major source of range error. Out of the three civil signals in GPS and Galileo system, L5/E5 signals have advanced signal features such as higher received power, faster chip rate and lower carrier frequency than L1/E1 and L2C/E6 signals. Hence, dual frequency receiver with combination of L1/L5 and E1/E5 signals is more suitable to remove ionosphere delay and get benefit from L5/E5 signal characteristics. However, the major limitation of linear combination of signal observations is an amplification of receiver noise. To get benefit of two frequency signals, a suitable signal processing architecture is needed. By taking advantage of GPS L5/Galileo E5 signal characteristics, a dual frequency signal processing architecture is proposed with an aim to reduce the ionosphere-free signal observation noise and to enhance the L1/E1 signal tracking loop sensitivity. The L1/E1 signal tracking loop sensitivity can be enhanced by Doppler aiding from L5/E5 signal tracking loop. The low noise L5/E5 signal Doppler aid reduces the noise in the L1/E1 signal tracking loop. Moreover, two frequency signals tracked with common Doppler estimate will have common observation errors, which will get cancel in linear combination of observations i.e. ionosphere-free, wide-lane etc. Further, code phase observations can be smoothed (Hatch filter) using carrier phase observations. The carrier phase observations are limited by cycle slip. Hence, we have investigated an optimum combination of divergence-free and ionosphere-free pseudorange smoothing using dual-frequency carrier Doppler observations for GPS L1/L5 and Galileo E1/E5 signals. The cycle slip in carrier phase observations can be neglected in carrier Doppler observations. The proposed signal processing architecture incorporated in GPS L1/L5 and Galileo E1/E5 dual frequency receiver will ensure robust signal tracking and minimum pseudorange errors, suitable to a range of high accuracy standalone and code differential positioning applications. The performance of the proposed dual frequency signal processing architecture is evaluated with GPS L1/L5 signals collected from Block-IIIF satellites.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering, Faculty of Electronics and Instrument Engineering, Samara National Research University  
Contributors: Bolla, P., Lohan, E.  
Number of pages: 9  
Pages: 72-80  
Publication date: 5 Jun 2018

#### Host publication information

Title of host publication: 2018 IEEE/ION Position, Location and Navigation Symposium, PLANS 2018  
Publisher: IEEE  
ISBN (Electronic): 9781538616475  
ASJC Scopus subject areas: Automotive Engineering, Aerospace Engineering, Control and Optimization  
Keywords: Carrier Doppler smoothing, Doppler aiding, Dual-frequency, Hatch filter  
DOIs:  
10.1109/PLANS.2018.8373367

#### Bibliographical note

EXT="Bolla, Padma"  
jufoid=72638  
Source: Scopus  
Source ID: 85048871323  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Toward Manageable Data Sources

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Research group: Software Engineering and Intelligent Systems, Pervasive Computing  
Contributors: Sillberg, P.  
Pages: 485-494  
Publication date: Jun 2018

#### Host publication information

Title of host publication: EJC 2018 : Proceedings of the 28th International Conference on Information Modelling and Knowledge Bases  
Publisher: Transport and Telecommunication Institute  
Editors: Endrjukaite, T., Kangassalo, H., Thalheim, B., Kiyoki, Y.  
ISBN (Electronic): 978-9984-818-89-4  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Industrial customers' organizational readiness for service innovations: Adopting data-based advanced services

Manufacturing firms that deliver complex products and systems are increasingly offering advanced data-based services to their customers. Customers are not always readily interested or willing to procure advanced services, and manufacturing firms need knowledge on how to promote the customer's service readiness. The aim in this paper is to develop and propose a framework on customer firms' organizational readiness for service innovations. We explore the experiences of customers of a manufacturing firm delivering complex systems and related services. The interview-based study reveals that customers use versatile processes for new service adoption, and engage multiple people and use varied criteria when deciding the adoption of data-based new services. Organizational readiness for service innovations appears in terms of change requirements concerning service context, supplier relations, and organizational habits and culture. The findings suggest actions for the manufacturing firms as ways to promote the customers' readiness for service innovations.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Industrial and Information Management, Research group: Center for Research on Operations Projects and Services  
Contributors: Martinsuo, M., Vaitinen, E.  
Number of pages: 17  
Publication date: Jun 2018

#### Host publication information

Title of host publication: Proceedings of the 25th Innovation and Product Development Management Conference  
Publisher: European Institute for Advanced Studies in Management, EIASM

### Publication series

Name: International Product Development Management Conference

ISSN (Electronic): 1998-7374

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Requirements from industrial internet for innovations in advanced industrial services

Manufacturing firms are experimenting with the possibilities of the Industrial Internet, while at the same time adding services and service-related business models to their offerings. Previous research is not, yet, clear on how these simultaneous transformations are handled, particularly when firms being to offer more advanced industrial services. The objective in this study is to identify the key expectations and requirements that an industrial system manufacturer faces, when adopting Industrial Internet and innovating advanced industrial services for its business customers. A single case study was carried out in a manufacturing firm offering complex industrial systems and related services to business customers. Seventeen interviews and three workshops were carried out, to collect data. The results show that the manufacturing firms need novel segmentation criteria, to map their customer base and its prospects for advanced services. Four systemic requirements are identified, for the manufacturing firm to benefit from the Industrial Internet in advanced industrial services. As Industrial Internet can enable advanced services that are highly systemic in nature, service innovations require that the business ecosystem is engaged in the development work together with the manufacturing firm.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Center for Research on Operations Projects and Services

Contributors: Martinsuo, M., Laurila, F.

Number of pages: 16

Publication date: Jun 2018

### Host publication information

Title of host publication: Proceedings of the 25th Innovation and Product Development Management Conference

Publisher: European Institute for Advanced Studies in Management, EIASM

### Publication series

Name: International Product Development Management Conference

ISSN (Electronic): 1998-7374

### Bibliographical note

INT=tj,"Laurila, Fanni"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Lifecycle-oriented framing of value at the front end of infrastructure projects

Infrastructure projects are expected to deliver value to their stakeholders long after their completion. Project value is multi-dimensional and subjective and evolves over the project lifecycle. The framing of the expected value by stakeholders is central to the public debate about proposed infrastructure projects and influences the financing decisions, however this framing is inadequately understood. The objective is to develop new knowledge on the ways in which stakeholders frame project lifecycle value at the front end of infrastructure projects. We compare two transport infrastructure projects in a qualitative, document-based study, map their dimensions of value at the project front end, and identify their approaches to lifecycle-oriented framing of value. The results reveal the dominance of financial, social and comparative value in the project front end, and identify four core themes in the lifecycle-oriented framing of value, including uncertainties, timing of cost and benefit realization, project relations, and external sponsorship.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Center for Research on Operations Projects and Services, University of Technology Sydney (UTS)

Contributors: Martinsuo, M., Vuorinen, L., Killen, C., Laiti, M.

Number of pages: 36

Publication date: Jun 2018

### Host publication information

Title of host publication: Proceedings of EURAM18 European Academy of Management conference 2018

Publisher: European Academy of Management, EURAM

ISBN (Electronic): 978-2-9602195-0-0

### Publication series

Name: EURAM conference

ISSN (Print): 2466-7498

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Agency relationships in global project business

Project-based firms (PBFs) serving global markets rely on local agents throughout the project life-cycle. In particular, agents are frequently used to support the PBFs efforts in project marketing, project implementation, and in provisioning of services to customers operating the delivered solutions. The purpose of this paper is to analyse principal-agent relationships in global project business from an agency perspective in order to provide further clarity to their salient characteristics, and to identify mechanisms through which agency problems can be mitigated. Based on our analysis of earlier literature, it appears that PBFs' principal-agent relationships with local actors during project front-end and operations phases are predominantly explorative in their nature whilst relationships during project implementation can be characterized as exploitative. Respectively, relationships of the former kind are governed by complex combinations of contractual and noncontractual mechanisms, while in relationships of the latter kind, rather simple contractual mechanisms are favoured by PBFs. Our findings imply that PBFs need to consider both the project life-cycle phase, as well as the characteristics and goals of individual agents, when designing mechanisms for governing their agency relationships.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Center for Research on Operations Projects and Services, Research group: Center for Research on Operations Projects and Services

Contributors: Ahola, T., Stähle, M., Martinsuo, M.

Number of pages: 38

Publication date: Jun 2018

### Host publication information

Title of host publication: Proceedings of EURAM18 European Academy of Management conference 2018

Publisher: European Academy of Management, EURAM

ISBN (Electronic): 978-2-9602195-0-0

### Publication series

Name: EURAM conference

ISSN (Print): 2466-7498

Keywords: Global project business, agency theory, local agents, project marketing, project implementation, service provisioning

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Re-use of engineering design rationale in Finnish SME project based industry

This study presents views on barriers of re-use of engineering design rationale. The research data was gathered by interviewing 29 persons who work in 19 different Finnish SME engineering project based companies. The topic was studied on three main levels: due to actions of business management, due to actions of project team and due to individuals own action. From this perspective, six categories of barriers of tacit knowledge re-use were found: Time management, Tools and documentation practices, Working methods, Validity of information, Well-being at work and Distinction in competence.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Mechanical Engineering and Industrial Systems, Research area: Design, Development and LCM, Tampere University

Contributors: Ellman, A., Paronen, J., Juuti, T. S., Tiainen, T.

Number of pages: 8

Pages: 1825-1832

Publication date: 24 May 2018

### Host publication information

Title of host publication: Proceedings of the Design 2018 15th International Design Conference

Publisher: The Design Society

ISBN (Electronic): 978-953-7738-59-4

Keywords: design knowledge, design practice, design management

DOIs:

10.21278/idc.2018.0363. Embargo ended: 1/07/18

### **Bibliographical note**

jufoid=84955

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Ready to sell? Requirements for promoting service selling in a manufacturing firm**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Center for Research on Operations Projects and Services

Contributors: Vaittinen, E., Martinsuo, M.

Number of pages: 9

Pages: 26-34

Publication date: May 2018

#### **Host publication information**

Title of host publication: Proceedings of the Spring Servitization Conference, Driving Competitiveness through Servitization, 14-16 May 2018

Publisher: Aston University

Editors: Bigdeli, A., Frandsen, T., Raja, J., Baines, T.

ISBN (Print): 9781854494481

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Measurements of impact force excitation on wooden floors**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Civil Engineering, Research group: Metal and Light-weight structures, Materials Science, Research group: Tribology and Machine Elements, Research group: Building Acoustics, Research group: Structural Mechanics

Contributors: Lietzen, J., Miettinen, J., Kylliäinen, M., Pajunen, S.

Number of pages: 6

Pages: 1617-1622

Publication date: May 2018

#### **Host publication information**

Title of host publication: Proceedings of the 11th European Congress and Exposition on Noise Control Engineering, Euronoise 2018, May 27-31 2018, Hersonissos, Crete, Greece : Reduce Noise to Improve Life, Crete, May 27-31, 2018

Place of publication: Hersonissos, Crete, Greece

Publisher: European Acoustic Association EAA

Article number: 272.161

#### **Publication series**

Name: Proceedings : European Conference on Noise Control

ISSN (Electronic): 2226-5147

URLs:

<http://www.euronoise2018.eu/component/contentbuilder/details/11/304/euronoise-2018-17-6-predicting-vibration-impact-structure-borne-sound-in-buildings?Itemid=256&start=0>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Finnish Round Robin Test on Airborne Sound Insulation**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Civil Engineering

Contributors: Lietzen, J., Kylliäinen, M.

Number of pages: 6

Pages: 1677-1682

Publication date: May 2018

#### **Host publication information**

Title of host publication: Proceedings of the 11th European Congress and Exposition on Noise Control Engineering, Euronoise 2018, May 27-31 2018, Hersonissos, Crete, Greece : Reduce Noise to Improve Life

Place of publication: Hersonissos, Crete, Greece  
Publisher: European Acoustic Association EAA  
Article number: 282.162

#### Publication series

Name: European Congress and Exposition on Noise Control Engineering  
ISSN (Print): 2226-5147  
URLs:

[http://www.euronoise2018.eu/docs/papers/282\\_Euronoise2018.pdf](http://www.euronoise2018.eu/docs/papers/282_Euronoise2018.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Ultra-large mode area single frequency anisotropic MOPA with double clad Yb-doped tapered fiber

We demonstrate all-fiber master oscillator - power amplifier delivered 70W output power at 1033.33nm with 8 kHz FWHM linewidth without any problems with SBS. The anisotropic ytterbium doped tapered double clad amplifier with 50  $\mu$ m MFD and polarization extinction ratio about 30 dB is developed as a burst stage. The output radiation demonstrated perfect beam quality ( $M^2=1.03/1.08$ ).

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Ampliconix Ltd, Institute of Radio Engineering and Electronics of the Russian Academy of Sciences, St. Petersburg State Polytechnical University

Contributors: Noronen, T., Fedotov, A., Rissanen, J., Gumenyuk, R., Butov, O., Chamorovskii, Y., Golant, K., Odnoblyudov, M., Filippov, V.

Number of pages: 6

Publication date: 1 Jan 2018

#### Host publication information

Title of host publication: Fiber Lasers XV : Technology and Systems

Publisher: SPIE, IEEE

Article number: 105121T

ISBN (Electronic): 9781510615090

#### Publication series

Name: Proceedings of SPIE

Publisher: SPIE

Volume: 10512

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: active fiber, fiber amplifier, Fiber laser

Electronic versions:

Noronen T. Ultra-large mode area single frequency anisotropic MOPA with double clad Yb-doped tapered fiber

DOIs:

10.1117/12.2288942

URLs:

<http://urn.fi/URN:NBN:fi:tty-201908211995>

#### Bibliographical note

EXT="Noronen, Teppo"

EXT="Fedotov, Andrei"

INT=fot, "Rissanen, Joonas"

EXT="Gumenyuk, Regina"

EXT="Filippov, Valery"

Source: Scopus

Source ID: 85045656071

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Sub-100 fs pulse generation from a Tm,Ho: CALYO laser mode-locked by a GaSb-based SESAM at ~2043 nm

We report on the first sub-100-fs mode-locked Ho<sup>3+</sup>-laser in the 2- $\mu$ m spectral range. The disordered co-doped Tm,Ho:CaYAlO<sub>4</sub> (Tm,Ho:CALYO) crystal produced pulses as short as 87 fs with 27-mW average output power at 80.45-MHz repetition rate.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Max Born Institute, Jiangsu Normal University, Universitat Rovira i Virgili, China Academy of Engineering Physics, ITMO University, Tongji University

Contributors: Zhao, Y., Wang, Y., Zhang, X., Mateos, X., Pan, Z., Loiko, P., Zhou, W., Xu, X., Xu, J., Shen, D., Suomalainen, S., Härkönen, A., Guina, M., Griebner, U., Petrov, V.

Publication date: 1 Jan 2018

### Host publication information

Title of host publication: CLEO : Science and Innovations, CLEO\_SI 2018

Publisher: OSA - The Optical Society

ISBN (Electronic): 9781557528209

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Mechanics of Materials

DOIs:

10.1364/CLEO\_SI.2018.SF2N.1

Source: Scopus

Source ID: 85048984709

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Process time importance in the product properties evolvement during extrusion coating of different LDPE grades

Process time in air gap region is one of the most important variables in the coating property development, when the molten polymer is moving from the die exit into the nip region in extrusion coating. Coating property evolvement of different LDPE grades are presented in the paper. The importance of the throughput rate and line speed to the process times is discussed by considering the effect of molecular structure of different polyolefins. The draw down ratio based on the grammage measurements is proposed to use in the practical situations.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science, Research group: Paper Converting and Packaging

Contributors: Suokas, E., Kuusipalo, J.

Number of pages: 9

Pages: 151-159

Publication date: 1 Jan 2018

### Host publication information

Title of host publication: 15th TAPPI Advanced Coating Fundamentals Symposium 2018 : Charlotte; United States; 14 April 2018 through 15 April 2018

Publisher: TAPPI Press

ISBN (Electronic): 9781510871885

ASJC Scopus subject areas: Media Technology, Materials Chemistry, Surfaces, Coatings and Films

URLs:

<http://www.scopus.com/inward/record.url?scp=85059262851&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 85059262851

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Multiwavelength surface contouring from phase-coded diffraction patterns

We propose a new algorithm for absolute phase retrieval from multiwavelength noisy phase coded diffraction patterns in the task of surface contouring. A lensless optical setup is considered with a set of successive single wavelength experiments. The phase masks are applied for modulation of the multiwavelength object wavefronts. The algorithm uses the forward and backward propagation for coherent light beams and sparsely encoding wavefronts which leads to the complex-domain block-matching 3D filtering. The key-element of the algorithm is an original aggregation of the multiwavelength object wavefronts for high-dynamic-range profile measurement. Numerical experiments demonstrate that the developed approach leads to the effective solutions explicitly using the sparsity for noise suppression and high-accuracy object profile reconstruction.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Research group: Computational Imaging-CI, ITMO University

Contributors: Katkovnik, V., Shevkunov, I., Petrov, N. V., Eguiazarian, K.

Publication date: 1 Jan 2018



### Host publication information

Title of host publication: Unconventional Optical Imaging 2018. Strasbourg, France  
Volume: 10677  
Publisher: SPIE  
Article number: 106771B  
ISBN (Print): 978-1-5106-1880-0

### Publication series

Name: Proceedings of SPIE - The International Society for Optical Engineering  
Volume: 10677  
ISSN (Electronic): 0277-786X  
ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering  
Keywords: absolute phase retrieval, discrete optical signal processing, Multiwavelength phase retrieval, phase imaging, surface contouring  
DOIs:  
10.1117/12.2306127  
Source: Scopus  
Source ID: 85052446644  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Digital image correlation study of the deformation and functioning of the human heart during open-heart surgery

Currently, ultrasound technology is routinely used for monitoring of the left side of the human heart during open-heart surgery. However, this method shows shortcomings in providing accurate information of the right ventricle and atrium. The aim of this paper is to demonstrate how Digital Image Correlation (DIC) can be used to monitor the functioning of the heart during open-heart surgery and potentially overcome some of the shortcomings of ultrasound methods. Being a contact-free method is a major asset from a practical implementation perspective of DIC. In this paper, we present the methodology of the experiment and some preliminary results of a study in which a DIC system was installed in an operating room and image sequences of the heart were taken at three stages of the surgery. We present a procedure for obtaining DIC measurements in this challenging setting, discuss how the data was extracted as well as how the measured values changed during the operation in the context of the surgical stages and interventions performed.

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Materials Science, Research group: Materials Characterization  
Contributors: Soltani, A., Curtze, S., Lahti, J., Järvelä, K., Laurikka, J., Hokka, M., Kuokkala, V. T.  
Number of pages: 9  
Pages: 19-27  
Publication date: 2018

### Host publication information

Title of host publication: Mechanics of Biological Systems, Materials and other topics in Experimental and Applied Mechanics - Proceedings of the 2017 Annual Conference on Experimental and Applied Mechanics  
Volume: 4  
Publisher: Springer New York LLC  
ISBN (Print): 9783319635514

### Publication series

Name: Conference Proceedings of the Society for Experimental Mechanics  
ISSN (Print): 2191-5644  
ISSN (Electronic): 2191-5652  
ASJC Scopus subject areas: Engineering(all), Computational Mechanics, Mechanical Engineering  
Keywords: Biomaterial characterization, Deformation, DIC, Motion, Open heart surgery  
DOIs:  
10.1007/978-3-319-63552-1\_4  
Source: Scopus  
Source ID: 85032509230  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Internal Heat Generation in Tension Tests of AISI 316 Using Full-Field Temperature and Strain Measurements

Full-field temperature and strain measurements were recorded during tension tests of AISI 316 on a hydraulic load frame at a strain rate of  $1 \text{ s}^{-1}$ . The temperature increase was measured on one side of the specimen using a high speed IR camera while the deformation was measured on the opposite side with a visible camera, each at a frame rate of 500 FPS. Uniform deformation of the specimen was observed up to strains of 0.25 until necking occurred and localization strains

reached up to 0.75 at failure. The maximum temperature as measured by the IR camera was 260 °C before failure. The fraction of plastic work converted to heat ( $\beta$ ) was calculated over the entire gage length of the specimen using the local measurements of stress, strain, and temperature and varied between 0.6 and 0.9 throughout the test.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science, The Ohio State University, Columbus, OH, USA, Department of Mechanical Engineering

Contributors: Smith, J., Kuokkala, V., Seidt, J., Gilat, A.

Number of pages: 7

Pages: 97-103

Publication date: 2018

#### Host publication information

Title of host publication: Advancement of Optical Methods in Experimental Mechanics, Volume 3. Conference Proceedings of the Society for Experimental Mechanics Series

Volume: 3

Publisher: Springer New York LLC

ISBN (Print): 978-3-319-63027-4

ISBN (Electronic): 978-3-319-63028-1

#### Publication series

Name: Conference Proceedings of the Society for Experimental Mechanics

ISSN (Print): 2191-5644

DOIs:

10.1007/978-3-319-63028-1\_16

#### Bibliographical note

JUFOID=72540

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Effects of adiabatic heating estimated from tensile tests with continuous heating

The mechanical behavior of metastable austenitic stainless steels is strongly influenced by the strain induced phase transformation of austenite into martensite. The phase transformation rate is significantly affected by the strain rate and by the adiabatic heating at higher strain rates. Uncoupling of the effects of strain rate and adiabatic heating can lead to a better understanding of the strain-induced martensitic transformation and allow more accurate material modeling. This paper presents a preliminary analysis of the effects of adiabatic heating during a tensile test. The adiabatic heating as a function of strain was calculated from the stress-strain curves obtained in adiabatic conditions. Then the tensile tests were carried out at a lower strain rate while continuously heating the specimen at the same rate as obtained in the adiabatic conditions. With this method, the thermal conditions of the adiabatic tests were reproduced in the low rate conditions, which would normally be isothermal without the external heating. The martensite fraction was evaluated using the magnetic balance method. In this paper, we present a detailed description of the experimental procedure and discuss the observed changes in the mechanical behavior and microstructure of the studied steel.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science, Research group: Materials Characterization

Contributors: Vazquez Fernandez, N., Isakov, M., Hokka, M., Kuokkala, V. T.

Number of pages: 7

Pages: 1-7

Publication date: 2018

#### Host publication information

Title of host publication: Dynamic Behavior of Materials - Proceedings of the 2017 Annual Conference on Experimental and Applied Mechanics

Volume: 1

Publisher: Springer New York LLC

ISBN (Print): 9783319629551

#### Publication series

Name: Conference Proceedings of the Society for Experimental Mechanics

ISSN (Print): 2191-5644

ASJC Scopus subject areas: Engineering(all), Computational Mechanics, Mechanical Engineering

Keywords: Adiabatic heating, Magnetic balance method, Martensite transformation, Metastable austenite, Stainless steel

DOIs:

10.1007/978-3-319-62956-8\_1

#### **Bibliographical note**

jufoid=72540

Source: Scopus

Source ID: 85033464703

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Adaptive Feedback in Local Coordinates for Real-time Vision-Based Motion Control Over Long Distances**

We studied the differences in noise-effects, depth-correlated behavior of sensors, and errors caused by mapping between coordinate systems in robotic applications of machine vision. In particular, the highly range-dependent noise densities for semi-unknown object detection were considered. An equation is proposed to adapt estimation rules to dramatic changes of noise over longer distances. This algorithm also benefits the smooth feedback of wheels to overcome variable latencies of visual perception feedback. Experimental evaluation of the integrated system is presented with/without the algorithm to highlight its effectiveness.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Automation and Hydraulic Engineering, Research group: Innovative Hydraulic Automation, Signal Processing, Cargotec Corporation

Contributors: M. Aref, M., Astola, P., Vihonen, J., Tabus, I., Ghabcheloo, R., Mattila, J.

Number of pages: 6

Publication date: 2018

#### **Host publication information**

Title of host publication: International Conference on Robotics and Mechantronics : (ICRoM 2017)

Volume: 320

Publisher: IOP Publishing Ltd.

Article number: 012009

#### **Publication series**

Name: IOP conference series : materials science and engineering

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ISSN (Electronic): 1757-899X

Electronic versions:

Aref\_2018\_IOP\_Conf.\_Ser.\_Mater.\_Sci.\_Eng.\_320\_012009

DOIs:

10.1088/1757-899X/320/1/012009

URLs:

<http://urn.fi/URN:NBN:fi:tty-201803071332>

#### **Bibliographical note**

EXT="Vihonen, Juho"

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Eye-in-Hand Manipulation for Remote Handling: Experimental Setup**

A prototype for eye-in-hand manipulation in the context of remote handling in the fusion power plant ITER is presented in this paper. The setup consists of an industrial robot manipulator with a modified open control architecture and equipped with a pair of stereoscopic cameras, a force/torque sensor, and pneumatic tools. It is controlled through a haptic device in a mock-up environment. The industrial robot controller has been replaced by a single industrial PC running Xenomai that has a real-time connection to both the robot controller and another Linux PC running as the controller for the haptic device. The new remote handling control environment enables further development of advanced control schemes for autonomous and semi-autonomous manipulation tasks. This setup benefits from a stereovision system for accurate tracking of the target objects with irregular shapes. The overall environmental setup successfully demonstrates the required robustness and precision that remote handling tasks need.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Automation and Hydraulic Engineering, Signal Processing, Research group: Innovative Hydraulic Automation, Fusion for Energy Joint Undertaking

Contributors: Niu, L., Suominen, O., M. Aref, M., Mattila, J., Ruiz, E., Esque, S.

Number of pages: 7

Publication date: 2018

#### Host publication information

Title of host publication: International Conference on Robotics and Mechantronics : (ICRoM 2017)

Volume: 320

Publisher: IOP Publishing Ltd.

Article number: 012007

#### Publication series

Name: IOP conference series : materials science and engineering

ISSN (Print): 1757-8981

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Electronic versions:

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DOIs:

10.1088/1757-899X/320/1/012007

URLs:

<http://urn.fi/URN:NBN:fi:tty-201803071333>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Gibbs Dyadic Differentiation on Groups - Evolution of the Concept

Differential operators are usually used to determine the rate of change and the direction of change of a signal modeled by a function in some appropriately selected function space. Gibbs derivatives are introduced as operators permitting differentiation of piecewise constant functions. Being initially intended for applications in Walsh dyadic analysis, they are defined as operators having Walsh functions as eigenfunctions. This feature was used in different generalizations and extensions of the concept firstly defined for functions on finite dyadic groups. In this paper, we provide a brief overview of the evolution of this concept into a particular class of differential operators for functions on various groups.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Department of Computer Science, Faculty of Electronic Engineering, Technical University of Dortmund

Contributors: Stankovic, R. S., Astola, J., Moraga, C.

Number of pages: 9

Pages: 229-237

Publication date: 2018

#### Host publication information

Title of host publication: Computer Aided Systems Theory – EUROCAST 2017 - 16th International Conference, Revised Selected Papers

Publisher: Springer Verlag

ISBN (Print): 9783319747262

#### Publication series

Name: Lecture Notes in Computer Science

Volume: 10672

ISSN (Print): 0302-9743

ISSN (Electronic): 1611-3349

ASJC Scopus subject areas: Theoretical Computer Science, Computer Science(all)

DOIs:

10.1007/978-3-319-74727-9\_27

#### Bibliographical note

EXT="Stankovic, Radomir S."

jufoid=79748

Source: Scopus

Source ID: 85041720547

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Real-time human pose estimation with convolutional neural networks

In this paper, we present a method for real-time multi-person human pose estimation from video by utilizing convolutional neural networks. Our method is aimed for use case specific applications, where good accuracy is essential and variation of the background and poses is limited. This enables us to use a generic network architecture, which is both accurate and fast. We divide the problem into two phases: (1) pre-training and (2) finetuning. In pre-training, the network is learned with

highly diverse input data from publicly available datasets, while in finetuning we train with application specific data, which we record with Kinect. Our method differs from most of the state-of-the-art methods in that we consider the whole system, including person detector, pose estimator and an automatic way to record application specific training material for finetuning. Our method is considerably faster than many of the state-of-the-art methods. Our method can be thought of as a replacement for Kinect in restricted environments. It can be used for tasks, such as gesture control, games, person tracking, action recognition and action tracking. We achieved accuracy of 96.8% (PCK@0.2) with application specific data.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Signal Processing, Univ of Oulu, Aalto University  
Contributors: Linna, M., Kannala, J., Rahtu, E.  
Number of pages: 8  
Pages: 335-342  
Publication date: 2018

#### Host publication information

Title of host publication: VISIGRAPP 2018 - Proceedings of the 13th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications  
Volume: 5  
Publisher: SCITEPRESS  
ISBN (Electronic): 9789897582905  
ASJC Scopus subject areas: Computer Vision and Pattern Recognition, Computer Graphics and Computer-Aided Design, Artificial Intelligence  
Keywords: Convolutional neural networks, Human pose estimation, Person detection  
DOIs:  
10.5220/0006624403350342  
URLs:  
<https://arxiv.org/pdf/1609.07420>  
Source: Scopus  
Source ID: 85047804818  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Evaluation of visual object trackers on equirectangular panorama

Equirectangular (360° spherical) panorama is the most widely adopted format to store and broadcast virtual reality (VR) videos. Equirectangular projection provides a new challenge to adapt existing computer vision methods for the novel input type. In this work, we introduce a new dataset which consists of high quality equirectangular videos captured using a high-end VR camera (Nokia OZO). We also provide the original wide angle (8× 195°) videos and densely annotated bounding boxes for evaluating object detectors and trackers. In this work, we introduce the dataset, compare state-of-the-art trackers for object tracking in equirectangular panorama and report detailed analysis of the failure cases which reveal potential factors to improve the existing visual object trackers for the new type of input.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Signal Processing, Nokia Technologies  
Contributors: Kart, U., Kämäräinen, J. K., Fan, L., Gabbouj, M.  
Number of pages: 8  
Pages: 25-32  
Publication date: 2018

#### Host publication information

Title of host publication: VISIGRAPP 2018 - Proceedings of the 13th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications  
Volume: 5  
Publisher: SCITEPRESS  
ISBN (Electronic): 9789897582905  
ASJC Scopus subject areas: Computer Vision and Pattern Recognition, Computer Graphics and Computer-Aided Design, Artificial Intelligence  
Keywords: 360°-video, Equirectangular, Tracking  
DOIs:  
10.5220/0006526200250032  
Source: Scopus  
Source ID: 85047804481  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### 360 panorama super-resolution using deep convolutional networks

We propose deep convolutional neural network (CNN) based super-resolution for 360 (equirectangular) panorama images used by virtual reality (VR) display devices (e.g. VR glasses). Proposed super-resolution adopts the recent CNN architecture proposed in (Dong et al., 2016) and adapts it for equirectangular panorama images which have specific characteristics as compared to standard cameras (e.g. projection distortions). We demonstrate how adaptation can be performed by optimizing the trained network input size and fine-tuning the network parameters. In our experiments with 360 panorama images of rich natural content CNN based super-resolution achieves average PSNR improvement of 1.36 dB over the baseline (bicubic interpolation) and 1.56 dB by our equirectangular specific adaptation.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Signal Processing, Nokia Technologies  
Contributors: Fakour-Sevom, V., Guldogan, E., Kämäräinen, J.  
Number of pages: 7  
Pages: 159-165  
Publication date: 2018

#### Host publication information

Title of host publication: VISIGRAPP 2018 - Proceedings of the 13th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications  
Volume: 4  
Publisher: SCITEPRESS  
ISBN (Electronic): 9789897582905  
ASJC Scopus subject areas: Computer Vision and Pattern Recognition, Computer Graphics and Computer-Aided Design, Artificial Intelligence  
Keywords: Deep convolutional neural network, Equirectangular panorama, Super-resolution, Virtual reality  
DOIs:  
10.5220/0006618901590165

#### Bibliographical note

EXT="Guldogan, Esin"  
Source: Scopus  
Source ID: 85047846712  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Elementary math to close the digital skills gap

All-encompassing digitalization and the digital skills gap pressure the current school system to change. Accordingly, to 'digi-jump', the Finnish National Curriculum 2014 (FNC-2014) adds programming to K-12 math. However, we claim that the anticipated addition remains too vague and subtle. Instead, we should take into account education recommendations set by computer science organizations, such as ACM, and define clear learning targets for programming. Correspondingly, the whole math syllabus should be critically viewed in the light of these changes and the feedback collected from SW professionals and educators. These findings reveal an imbalance between supply and demand, i.e., what is over-taught versus under-taught, from the point of view of professional requirements. Critics claim an unnecessary surplus of calculus and differential equations, i.e., continuous mathematics. In contrast, the emphasis should shift more towards algorithms and data structures, flexibility in handling multiple data representations, logic; in summary - discrete mathematics.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Pervasive Computing, Jyväskylän yliopisto  
Contributors: Niemelä, P., Valmari, A.  
Number of pages: 12  
Pages: 154-165  
Publication date: 2018

#### Host publication information

Title of host publication: CSEDU 2018 - Proceedings of the 10th International Conference on Computer Supported Education  
Volume: 2  
Publisher: SCITEPRESS  
ISBN (Electronic): 9789897582912  
ASJC Scopus subject areas: Computer Science Applications, Information Systems, Education  
Keywords: Computing in math syllabus, Continuous vs. discrete math, Digital skills gap, Effectiveness of education, K-12 computer science education, Professional development of software professionals

DOIs:

10.5220/0006800201540165

### **Bibliographical note**

EXT="Valmari, Antti"

Source: Scopus

Source ID: 85047771637

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Keyframe-based video summarization with human in the loop**

In this work, we focus on the popular keyframe-based approach for video summarization. Keyframes represent important and diverse content of an input video and a summary is generated by temporally expanding the keyframes to key shots which are merged to a continuous dynamic video summary. In our approach, keyframes are selected from scenes that represent semantically similar content. For scene detection, we propose a simple yet effective dynamic extension of a video Bag-of-Words (BoW) method which provides over segmentation (high recall) for keyframe selection. For keyframe selection, we investigate two effective approaches: local region descriptors (visual content) and optical flow descriptors (motion content). We provide several interesting findings. 1) While scenes (visually similar content) can be effectively detected by region descriptors, optical flow (motion changes) provides better keyframes. 2) However, the suitable parameters of the motion descriptor based keyframe selection vary from one video to another and average performances remain low. To avoid more complex processing, we introduce a human-in-the-loop step where user selects keyframes produced by the three best methods. 3) Our human assisted and learning-free method achieves superior accuracy to learning-based methods and for many videos is on par with average human accuracy.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Research group: Vision

Contributors: Ainasoja, A. E., Hietanen, A., Lankinen, J., Kämäräinen, J.

Number of pages: 10

Pages: 287-296

Publication date: 2018

### **Host publication information**

Title of host publication: VISIGRAPP 2018 - Proceedings of the 13th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications

Volume: 4

Publisher: SCITEPRESS

ISBN (Electronic): 9789897582905

ASJC Scopus subject areas: Computer Vision and Pattern Recognition, Computer Graphics and Computer-Aided Design, Artificial Intelligence

Keywords: Optical flow descriptors, Region descriptors, Video summarization, Visual bag-of-words

DOIs:

10.5220/0006619202870296

### **Bibliographical note**

INT=sgn,"Lankinen, Jukka"

Source: Scopus

Source ID: 85047872595

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Hierarchical deformable part models for heads and tails**

Imbalanced long-tail distributions of visual class examples inhibit accurate visual detection, which is addressed by a novel Hierarchical Deformable Part Model (HDPM). HDPM constructs a sub-category hierarchy by alternating bootstrapping and Visual Similarity Network (VSN) based discovery of head and tail sub-categories. We experimentally evaluate HDPM and compare with other sub-category aware visual detection methods with a moderate size dataset (Pascal VOC 2007), and demonstrate its scalability to a large scale dataset (ILSVRC 2014 Detection Task). The proposed HDPM consistently achieves significant performance improvement in both experiments.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Research group: Vision

Contributors: Yancheshmeh, F. S., Chen, K., Kämäräinen, J.

Number of pages: 11

Pages: 45-55

Publication date: 2018

#### Host publication information

Title of host publication: VISIGRAPP 2018 - Proceedings of the 13th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications

Volume: 5

Publisher: SCITEPRESS

ISBN (Electronic): 9789897582905

ASJC Scopus subject areas: Computer Vision and Pattern Recognition, Computer Graphics and Computer-Aided Design, Artificial Intelligence

Keywords: Deformable part model, Imbalanced datasets, Localization, Long-tail distribution, Object detection, Sub-category discovery, Visual similarity network

DOIs:

10.5220/0006532700450055

Source: Scopus

Source ID: 85047826548

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Making the cloud work for software producers: Linking architecture, operating cost and revenue

Cloud migration is concerned with moving an on-premise software system into the cloud. In this paper, we focus on software producers adopting the cloud to provide their solutions to enterprise customers. Their challenge is to migrate a software product, developed in-house and traditionally delivered on-premise, to an Infrastructure-as-a-Service or Platform-as-a-Service solution, while also mapping an existing traditional licensing model on to a cloud monetization model. The analysis of relevant cost types and factors of cloud computing generate relevant information for the software producers when deciding to adopt cloud computing, and defining software pricing. We present an integrated framework for informing cloud monetization based on operational cost factors for migrating to the cloud and test it in a real-life case study. Differences between basic virtualization of the software product and using fully cloud-native platform services for re-architecting the product in question are discussed.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, Dublin City University, Free University of Bolzano-Bozen, Human-Centered Technology (IHTE)

Contributors: Rosati, P., Fowley, F., Pahl, C., Taibi, D., Lynn, T.

Number of pages: 12

Pages: 364-375

Publication date: 2018

#### Host publication information

Title of host publication: CLOSER 2018 - Proceedings of the 8th International Conference on Cloud Computing and Services Science

Publisher: SCITEPRESS

ISBN (Electronic): 9789897582950

ASJC Scopus subject areas: Computer Science (miscellaneous), Software, Computer Science Applications

Keywords: Architecture migration, Cloud migration, Monetization, Software producer, Total cost of ownership

DOIs:

10.5220/0006679303640375

Source: Scopus

Source ID: 85048894202

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Development of efficient electrically pumped nanolasers based on InAlGaAs tunnel junction

We propose and experimentally demonstrate a metallo-dielectric nanolasers utilizing an InAlGaAs tunnel junction for efficient carrier injection, which reduce the complexity when optimizing the metal contact, and reduces the device resistance.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Research group: ORC, University of California San Diego

Contributors: Fang, C. Y., Vallini, F., Amili, A. E., Tukiainen, A., Lyytikäinen, J., Guina, M., Fainman, Y.

Publication date: 2018

#### Host publication information



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Publisher: OSA - The Optical Society  
ISBN (Electronic): 9781557528209  
ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Mechanics of Materials  
DOIs:  
10.1364/CLEO\_SI.2018.SW4Q.4  
Source: Scopus  
Source ID: 85048984466  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Frequency-doubled VECSEL employing a Volume Bragg Grating for linewidth narrowing**

We report on a frequency-doubled VECSEL emitting at 512.6 nm. The laser spectrum was narrowed with a Volume Bragg Grating and the intracavity frequency-doubling was achieved with a periodically poled MgO-doped lithium niobate.

#### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Photonics  
Contributors: Kantola, E., Penttinen, J., Leinonen, T., Ranta, S., Guina, M.  
Publication date: 2018

#### **Host publication information**

Title of host publication: CLEO : Applications and Technology, CLEO\_AT 2018  
Publisher: OSA - The Optical Society  
ISBN (Electronic): 9781557528209  
ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Mechanics of Materials  
DOIs:  
10.1364/CLEO\_AT.2018.JTu2A.17  
Source: Scopus  
Source ID: 85049150395  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **High performance GaSb superluminescent diodes for tunable light source at 2 $\mu\text{m}$ and 2.55 $\mu\text{m}$**

We report on GaSb-based superluminescent diodes emitting an output power of 70 mW at 2  $\mu\text{m}$  and the first demonstration of 2.55  $\mu\text{m}$  SLD with mW-level output power at room temperature for compact gas sensors.

#### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Photonics, Research group: ORC  
Contributors: Zia, N., Viheriälä, J., Koivusalo, E., Aho, A., Suomalainen, S., Guina, M.  
Publication date: 2018

#### **Host publication information**

Title of host publication: CLEO : Applications and Technology, CLEO\_AT 2018  
Publisher: OSA - The Optical Society  
ISBN (Electronic): 9781557528209  
ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Mechanics of Materials  
DOIs:  
10.1364/CLEO\_AT.2018.JTu2A.28  
Source: Scopus  
Source ID: 85049139256  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Frequency-doubled wafer-fused 638 nm VECSEL with an output power of 5.6 W**

We report on a frequency doubled vertical-external-cavity surface-emitting laser emitting 5.6 W at 635 nm. The cavity employed a wafer-fused AlInGaAs/InP-AlAs/GaAs gain mirror in a V-shaped configuration. The heatsink temperature was 20 °C.

#### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Photonics, RTI-Research SA

Contributors: Kantola, E., Leinonen, T., Rantamäki, A., Guina, M., Sirbu, A., Iakovlev, V.  
Publication date: 2018

#### Host publication information

Title of host publication: CLEO : Applications and Technology, CLEO\_AT 2018

Publisher: OSA - The Optical Society

ISBN (Electronic): 9781557528209

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Mechanics of Materials

DOIs:

10.1364/CLEO\_AT.2018.JTu2A.10

Source: Scopus

Source ID: 85049146963

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Alpha radiation induced luminescence in solar blind spectral region

Intense luminescence in the solar blind spectral region is produced by modifying the gas atmosphere around an alpha emitter. This enables standoff detection of alpha radiation under daylight conditions.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Physics, Photonics, Helsinki Institute of Physics

Contributors: Kerst, T., Toivonen, J.

Publication date: 2018

#### Host publication information

Title of host publication: CLEO : Applications and Technology, CLEO\_AT 2018

Publisher: OSA - The Optical Society

ISBN (Electronic): 9781557528209

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Mechanics of Materials

Electronic versions:

alpha\_radiation\_induced\_luminescence\_in\_solar\_blind\_spectral\_region

DOIs:

10.1364/CLEO\_AT.2018.ATh4O.8

URLs:

<http://urn.fi/URN:NBN:fi:tty-201908232002>

Source: Scopus

Source ID: 85049133557

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Sub-parts-per-trillion sensitivity in trace gas detection by cantilever-enhanced photo-acoustic spectroscopy

We report a simple cantilever-enhanced photoacoustic detector, which reaches exceptionally good sensitivity in trace gas detection of hydrogen fluoride by using a highly stable narrow-linewidth optical parametric oscillator at 2.476  $\mu\text{m}$ .

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, University of Helsinki, Gasera Ltd.

Contributors: Tomberg, T., Vainio, M., Hieta, T., Halonen, L.

Publication date: 2018

#### Host publication information

Title of host publication: CLEO : Applications and Technology, CLEO\_AT 2018

Publisher: OSA - The Optical Society

ISBN (Electronic): 9781557528209

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Mechanics of Materials

DOIs:

10.1364/CLEO\_AT.2018.ATh1O.8

Source: Scopus

Source ID: 85049146097

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Real-time measurements of nonlinear instabilities in optical fibers**

We review recent advances in the real-time characterization of instabilities in nonlinear fiber optics systems. In particular, we show how these techniques can provide novel insight into the dynamics of ultrafast complex optical systems.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, UMR 6174

Contributors: Ryczkowski, P., Närhi, M., Billet, C., Merolla, J. M., Dudley, J. M., Genty, G.

Publication date: 2018

#### **Host publication information**

Title of host publication: CLEO : Applications and Technology, CLEO\_AT 2018

Publisher: OSA - The Optical Society

ISBN (Electronic): 9781557528209

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Mechanics of Materials

DOIs:

10.1364/CLEO\_AT.2018.AF2Q.1

Source: Scopus

Source ID: 85049124778

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **A social capital perspective on gaining optimal solutions from suppliers as preferred customer**

Capable suppliers willing to provide their best possible offering are increasingly scarce. Such suppliers increasingly select customers to whom they invest their best resources and provide the best offerings. The existing research has paid only limited attention to the antecedents of supplier's solution provision performance, i.e. the design of a good solution and its implementation. Further, existing empirical research has rarely taken a detailed view on the phases of a supplier's solution provision. This study seeks answers to the following questions: can the availability or absence of social capital in the supplier-buyer relationship explain supplier's solution provision performance?, what is the importance of different forms of social capital in supplier's solution provision performance and the different phases of solution provision? The empirical data of this study is collected with a survey addressed to suppliers of four large companies. The survey is sent to 1630 supplier companies and 662 usable responses are received resulting in a response rate of 41%. Partial least squares (PLS) structural equation modelling (SEM) and polynomial regression are used to analyze the data. The results demonstrate the importance of social capital in obtaining the optimal solution from suppliers. The results also present that different types of social capital have different influence on the phases of solution provision. Diagnosis of customer needs appears as the phase most significantly driven by social capital prevalent in the supplier-buyer relationship. The results also show that different forms of social capital can compensate each other and that structural capital can take a stronger role compared to relational capital.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, University of Twente

Contributors: Jääskeläinen, A., Schiele, H., Aarikka-Stenroos, L.

Publication date: 2018

#### **Host publication information**

Title of host publication: Academy of Management Proceedings

Volume: 2018

Publisher: Academy of Management AOM

Edition: 1

#### **Publication series**

Name: Academy of Management Proceedings

Volume: 2018

No.: 1

ISSN (Print): 0065-0668

ISSN (Electronic): 2151-6561

Electronic versions:

Social capital and solution provision\_AOM

DOIs:

10.5465/AMBPP.2018.16278abstract

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Integrated multi-wavelength mid-IR light source for gas sensing**

Cost effective multi-wavelength light sources are key enablers for spectroscopic applications at Mid-IR wavelength range. Utilizing a novel Mid-IR Si-based photonic integrated circuit filter and wide-band Mid-IR SLEDs, we show the concept of a light source that covers 2.7-3.5  $\mu\text{m}$  wavelength range with a resolution  $<1\text{nm}$ . The spectral bands are switchable and tunable and they can be modulated. The source allows for the fabrication of an affordable multi-band gas sensor with good selectivity and sensitivity. The unit price can be lowered in high volumes by utilizing tailored molded IR lens technology and automated packaging and assembling technologies. The status of the development of the key components of the light source are reported. The Mid-IR PIC is based on the use of thick-SOI technology, SLED is based on AlGaInAsSb materials and the lenses are tailored single crystal, nonoxide glass and heavy metal oxide glasses fabricated by the use of hot-embossing. The packaging concept utilizing automated assembly tools are depicted. In safety and security applications, the Mid-IR wavelength range covered by the source allows for the detection of several harmful gas components with a single sensor. At the moment, affordable sources are not available. The market impact is expected to be disruptive, since the devices currently in the market are either complicated, expensive and heavy instruments, or the applied measurement principles are inadequate in terms of stability and selectivity.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Research group: ORC, VTT Technical Research Centre of Finland, Institute of Electronic Materials Technology, Vaisala Oyj, Airoptic Sp. z o.o., GasSecure, VIGO System S.A.

Contributors: Karioja, P., Alajoki, T., Cherchi, M., Ollila, J., Harjanne, M., Heinilehto, N., Suomalainen, S., Zia, N., Tuorila, H., Viheriälä, J., Guina, M., Buczynski, R., Kasztelaniec, R., Salo, T., Virtanen, S., Kluczynski, P., Borgen, L., Ratajczyk, M., Kalinowski, P.

Publication date: 2018

### **Host publication information**

Title of host publication: Next-Generation Spectroscopic Technologies XI

Publisher: SPIE, IEEE

Article number: 106570A

ISBN (Electronic): 9781510618251

### **Publication series**

Name: SPIE Conference Proceedings

Volume: 10657

ISSN (Print): 0277-786X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: gas sensing, Mid-IR integrated optics, Mid-IR lens, photonics packaging, PIC, Si photonics, SLED

DOIs:

10.1117/12.2305712

### **Bibliographical note**

jufoid=71479

Source: Scopus

Source ID: 85050701514

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Model for efficient development of security audit criteria**

Cyber-attacks have grown in importance to become a matter of national security. A growing number of states and organisations around the world have been developing defensive and offensive capabilities for cyber warfare. Security criteria are important tools for defensive capabilities of critical communications and information systems (CIS). Various criteria have been developed for designing, implementing and auditing CIS. However, the development of criteria is inadequately supported by currently available guidance. The relevant guidance is mostly related to criteria selection. The abstraction level of the guidance is high. This may lead to inefficient criteria development work. In addition, the resulting criteria may not fully meet their goals. To ensure efficient criteria development, the guidance should be supported with concrete level implementation guidelines. This paper proposes a model for efficient development of security audit criteria. The model consists of criteria design goals and concrete implementation guidelines to achieve these goals. The model is based on the guidance given by ISACA and on the criteria development work by FICORA, the Finnish Communications Regulatory Authority. During the years 2008-2017, FICORA has actively participated in development and usage of three versions of Katakri, the Finnish national security audit criteria. The paper includes a case study that applies the model to existing security criteria. The case study covers a review of the criteria composed of the Finnish VAHTI-instructions. During the review, all supported design goals and implementation guidelines of the model were scrutinised. The results of the case study indicate that the model is useful for reviewing existing criteria. The rationale is twofold. First, several remarkable shortcomings were identified. Second, the identification process was time-efficient. The results also suggest that the model would be useful for criteria under development. Addressing the identified shortcomings during the development phase would have made the criteria more efficient, usable and understandable.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, Univ of Oulu, Population Register Centre, Finnish Communications Regulatory Authority

Contributors: Kelo, T., Eronen, J., Rousku, K.

Number of pages: 9

Pages: 244-252

Publication date: 2018

### Host publication information

Title of host publication: Proceedings of the 17th European Conference on Cyber Warfare and Security, ECCWS 2018

Publisher: Curran Associates

ISBN (Electronic): 9781911218852

ASJC Scopus subject areas: Information Systems, Information Systems and Management, Safety, Risk, Reliability and Quality

Keywords: Audit, Criteria, Katakri, Security, VAHTI

Source: Scopus

Source ID: 85050826806

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Highly-efficient Ho:KY(WO<sub>4</sub>)<sub>2</sub> thin-disk lasers at 2.06 μm

The recent advances in the development of Holmium monoclinic double tungstate thin-disk lasers are reviewed. The thin-disk is based on a 250-μm-thick 3 at. % Ho:KY(WO<sub>4</sub>)<sub>2</sub> active layer grown on a (010)-oriented KY(WO<sub>4</sub>)<sub>2</sub> substrate. When pumped by a Tm-fiber laser at 1960 nm with a single-bounce pump geometry, the continuous-wave Ho:KY(WO<sub>4</sub>)<sub>2</sub> thin-disk laser generates an output power of 1.01 W at 2057 nm corresponding to a slope efficiency  $\eta$  of 60% and a laser threshold of only 0.15 W. The thin-disk laser is passively Q-switched with a GaSb-based quantum-well semiconductor saturable absorber mirror. In this regime, it generates an average output power of 0.551 W at ~2056 nm with  $\eta = 44\%$ . The best pulse characteristics are 4.1 μJ/201 ns at a repetition rate of 135 kHz. The laser performance, beam quality and thermo-optic aberrations of such lasers are strongly affected by the Ho<sup>3+</sup> doping concentration. For the 3 at.% Ho<sup>3+</sup>-doped thin-disk, the thermal lens is negative (the sensitivity factors for the two principal meridional planes are -1.7 and -0.6 m<sup>-1</sup>/W) and astigmatic. The Ho:KY(WO<sub>4</sub>)<sub>2</sub> epitaxial structures are promising as active elements in mode-locked thin-disk lasers at ~2060 nm.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Research group: ORC, Max Born Institute, Universitat Rovira i Virgili, LISA Laser Products OHG, ITMO University, Institute of Laser Physics of the Siberian Branch of the RAS

Contributors: Mateos, X., Loiko, P., Lamrini, S., Scholle, K., Fuhrberg, P., Suomalainen, S., Härkönen, A., Guina, M., Vatnik, S., Vedin, I., Aguiló, M., Díaz, F., Wang, Y., Griebner, U., Petrov, V.

Publication date: 2018

### Host publication information

Title of host publication: Pacific-Rim Laser Damage 2018 : Optical Materials for High-Power Lasers

Publisher: SPIE, IEEE

Article number: 107130J

ISBN (Electronic): 9781510619920

### Publication series

Name: Proceedings of SPIE

Volume: 10713

ISSN (Print): 0277-786X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: 2-micron lasers, Ho-lasers, monoclinic double tungstates, Q-switched lasers, thin-disk lasers

DOIs:

10.1117/12.2316822

### Bibliographical note

jufoid=71479

Source: Scopus

Source ID: 85051249536

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Automated pile transfer work cycles with a robotic wheel loader

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Automation and Hydraulic Engineering, Research group: Robotics and Automation, Research group: Innovative Hydraulic Automation

Contributors: Halbach, E., Kolu, A., Ghabcheloo, R.

Number of pages: 8

Publication date: 2018

### Host publication information

Title of host publication: 17th International Conference on Computing in Civil and Building Engineering (ICCCBE) : Tampere, 5-7 June 2018

Place of publication: Tampere, Finland

Publisher: RIL

Editors: Mela, K., Pajunen, S., Raasakka, V.

ISBN (Electronic): 978-951-758-632-0

URLs:

<https://www.ril.fi/en/events/icccbe-2018.html>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## JPEG Pleno: a standard framework for representing and signaling plenoptic modalities

In recent years, we have observed the advent of plenoptic modalities such as light fields, point clouds and holography in many devices and applications. Besides plenty of technical challenges brought by these new modalities, a particular challenge is arising at the horizon, namely providing interoperability between these devices and applications, and – in addition – at a cross-modality level. Based on these observations the JPEG committee (ISO/IEC JTC1/SC29/WG1 and ITU-T SG16) has initiated a new standardization initiative – JPEG Pleno – that is intended to define an efficient framework addressing the above interoperability issues. In this paper, an overview is provided about its current status and future plans.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Research group: Signal Interpretation and Compression-SIC, Vrije Universiteit Brussel, Ostendo, Ecole Polytechnique Fédérale de Lausanne, Instituto Superior Tecnico, Lissabon, Portugal, University of Science and Technology of China

Contributors: Schelkens, P., Alpaslan, Z., Ebrahimi, T., Pereira, F., Pinheiro, A., Tabus, I., Chen, Z.

Number of pages: 10

Publication date: 2018

### Host publication information

Title of host publication: SPIE Proceedings Volume 10752: Applications of Digital Image Processing XLI

Volume: 10752

Publisher: SPIE

### Publication series

Name: SPIE Conference Proceedings

ISSN (Print): 0277-786X

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## Underpinning Interrelated Factors of Physical, Virtual, and Social Learning Environments

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering, Research group: Urban Planning and Design, Architecture

Contributors: Kangas, J., Poutanen, J.

Pages: 8087-8096

Publication date: 2018

### Host publication information

Title of host publication: ICERI2018 Proceedings

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### Publication series

Name: ICERI proceedings

ISSN (Electronic): 2340-1095

Electronic versions:

iceri18\_kangas\_poutanen\_id459

DOIs:

10.21125/iceri.2018.0459

URLs:

<http://urn.fi/URN:NBN:fi:tuni-201910013623>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Laser Scanning Tasks of Building Refurbishment Project

Laser scanning is quickly becoming a common and beneficial tool in the field of civil engineering. In refurbishment projects, fast data capture, millions of measurement points and high accuracy have marked laser scanners out from conventional measurements as a data acquisition method. By using laser scanning and point clouds in refurbishment projects multiple benefits could be achieved: reduction of mistakes in the design phase and on the building site, more realistic visualizations of existing buildings, and savings in time and costs. The utility of laser scanning and point clouds surfaces especially when renovating old complex buildings without accurate construction drawings, documents or measurements.

However, the process of the procurement of laser scanning is generally unclear and there is very little standardization and regulation in the matter. The roles and assignments of every party in the process are obscure and the lack of knowledge about the use and the limits and the benefits of laser scanning in a building project can reduce clients' interest toward laser scanning.

This paper presents the different kinds of refurbishment project types where laser scanning has been used in Finland. The study represents the benefits, limits and challenges concerning laser scanning faced in these projects. The results of the study are based on the interviews of the organizations with experience in laser scanning in refurbishment projects. The study reveals that laser scanning is considered a valid and accurate method for data acquisition in refurbishment projects and it has been used also for visualization, piecework, quantity surveying and detail measuring and observing. However, there have been challenges especially with laser scanning operations in buildings in use, on the technical determination of laser scanning and during and after the process from a point cloud into an inventory model.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Civil Engineering, Research group: Responsible Construction

Contributors: Uotila, U., Saari, A., Junnonen, J.

Publication date: 2018

### Host publication information

Title of host publication: Proceedings of the 17th International Conference on Computing in Civil and Building Engineering (ICCCBE)

ISBN (Print): 978-951-758-632-0

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Architectural patterns for microservices: A systematic mapping study

Microservices is an architectural style increasing in popularity. However, there is still a lack of understanding how to adopt a microservice-based architectural style. We aim at characterizing different microservice architectural style patterns and the principles that guide their definition. We conducted a systematic mapping study in order to identify reported usage of microservices and based on these use cases extract common patterns and principles. We present two key contributions. Firstly, we identified several agreed microservice architecture patterns that seem widely adopted and reported in the case studies identified. Secondly, we presented these as a catalogue in a common template format including a summary of the advantages, disadvantages, and lessons learned for each pattern from the case studies. We can conclude that different architecture patterns emerge for different migration, orchestration, storage and deployment settings for a set of agreed principles.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, Free University of Bolzano-Bozen

Contributors: Taibi, D., Lenarduzzi, V., Pahl, C.

Number of pages: 12

Pages: 221-232  
Publication date: 2018

#### Host publication information

Title of host publication: CLOSER 2018 - Proceedings of the 8th International Conference on Cloud Computing and Services Science

Publisher: SCITEPRESS

ISBN (Electronic): 9789897582950

ASJC Scopus subject areas: Computer Science (miscellaneous), Software, Computer Science Applications

Keywords: Architectural style, Architecture pattern, Cloud migration, Cloud native, DevOps, Microservices

DOIs:

10.5220/0006798302210232

Source: Scopus

Source ID: 85046716130

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Action recognition using the 3D dense microblock difference

This paper describes a framework for action recognition which aims to recognize the goals and activities of one or more human from a series of observations. We propose an approach for the human action recognition based on the 3D dense micro-block difference. The proposed algorithm is a two-stage procedure: (a) image preprocessing using a 3D Gabor filter and (b) a descriptor calculation using 3D dense micro-block difference with SVM classifier. At the first step, an efficient spatial computational scheme designed for the convolution with a bank of 3D Gabor filters is present. This filter intensifies motion using a convolution for a set of 3D patches and arbitrarily-oriented anisotropic Gaussian. For preprocessed frames, we calculate the local features such as 3D dense micro-block difference (3D DMD), which capture the local structure from the image patches at high scales. This approach is processing the small 3D blocks with different scales from frames which capture the microstructure from it. The proposed image representation is combined with fisher vector method and linear SVM classifier. We evaluate the proposed approach on the UCF50, HMDB51 and UCF101 databases. Experimental results demonstrate the effectiveness of the proposed approach on video with a stochastic textures background with comparisons of the state-of-The-Art methods.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Don State Technical University, Moscow State University of Technology 'Stankin', Beijing Jiaotong University

Contributors: Voronin, V., Pismenskova, M., Zelensky, A., Cen, Y., Nadykto, A., Egiazarian, K.

Publication date: 2018

#### Host publication information

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Publisher: SPIE

Article number: 1080200

ISBN (Electronic): 9781510621879

#### Publication series

Name: Proceedings of SPIE

Volume: 10802

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: 3D Gabor filter., Action recognition, Micro-block difference, Texture

DOIs:

10.1117/12.2326801

#### Bibliographical note

jufoid=71479

Source: Scopus

Source ID: 85057423236

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### High-speed manufacturing of antimicrobial paper

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication



Organisations: Physics, Abo Akademi University, University of Turku, Center for Functional Materials at Biological Interfaces (FUNMAT)

Contributors: Brobbey, K. J., Haapanen, J., Gunell, M., Mäkelä, J. M., Eerola, E., Saarinen, J. J., Toivakka, M.

Number of pages: 3

Pages: 564-566

Publication date: 2018

#### Host publication information

Title of host publication: Paper Conference and Trade Show, PaperCon 2018

Publisher: TAPPI Press

ISBN (Electronic): 9781510871892

ASJC Scopus subject areas: Forestry, Plant Science, Industrial and Manufacturing Engineering

Source: Scopus

Source ID: 85060366453

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Evaluating the contrast of planar periodic patterns on paper

Certain paper products contain functional or decorative periodic patterns. Such patterns can be e.g. the 3 D structure variations in tissue paper or the decorative structure in tobacco paper. At present, the contrast of such patterns is not measured online and thus the uniformity of the end-products may vary. This paper introduces two contrast estimation methods based on Fourier and histogram analysis. The performance of the estimation methods was evaluated with the reference results made by the human panel. It was noticed that both methods estimate the contrast rather reliably. However, if the wavelength of the pattern was close to the size of the image, the Fourier method was not working appropriately. The image data available in this work was collected online at the tobacco and tissue paper machines. The tobacco paper was measured with light transmittance imaging system and the tissue paper was measured with photometric stereo imaging system that estimates the 3 D surface of the paper. It was noticed that the present imaging systems can be utilized as such in the estimation of contrast.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Automation and Hydraulic Engineering, Valmet Automation Oy

Contributors: Raunio, J., Makela, I., Mäntylä, M., Ritala, R.

Number of pages: 9

Pages: 294-302

Publication date: 2018

#### Host publication information

Title of host publication: Paper Conference and Trade Show, PaperCon 2018

Publisher: TAPPI Press

ISBN (Electronic): 9781510871892

ASJC Scopus subject areas: Forestry, Plant Science, Industrial and Manufacturing Engineering

Source: Scopus

Source ID: 85060386224

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### High power picosecond MOPA with anisotropic ytterbium-doped tapered double-clad fiber

Generation of ultrashort pulses with high average power and moderately high pulse energy generally requires a mode-locked laser followed by several fiber amplifiers in a master-oscillator power-amplifier configuration. Recently, gain-switched diode lasers have emerged as a viable replacement to mode-locked oscillators as sources of sub-100 ps pulses in these systems, but the low output power available from the diodes necessitates the use of multiple costly amplifier stages. Here, we demonstrate the generation of 1.7  $\mu$ J pulses at 1030 nm, and 11.7  $\mu$ J pulses at 1064 nm from a gain-switched diode seeded compact MOPA with only two amplification stages. The final stage is a tapered fiber amplifier, whose geometry efficiently suppresses amplified spontaneous emission and allows reaching a gain of similar to 40 dB. This research work is still in progress, and further increase in pulse energy should be possible by optimizing the setup.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Research group: Nanophotonics, Ampliconix Ltd, ITMO Univ, ITMO University, Dept Photon & Opt Informat Technol, Kotelnikov Inst Radio Engn & Elect, Kotelnikov Institute of Radioengineering & Electronics, Tampere Univ Technol, Tampere University of Technology, Peter Great St Petersburg State Polytech Univ, Peter the Great St.Petersburg Polytechnic University

Contributors: Fedotov, A., Noronen, T., Rissanen, J., Gumenyuk, R., Petrov, A., Chamorovskii, Y., Golant, K., Odnooblyudov, M., Filippov, V.

Number of pages: 7  
Publication date: 2018

#### Host publication information

Title of host publication: Proceedings of SPIE : Fiber Lasers and Glass Photonics: Materials through Applications  
Volume: 10683  
Publisher: SPIE-INT SOC OPTICAL ENGINEERING  
Editors: Taccheo, S., Mackenzie, J., Ferrari, M.  
ISBN (Print): 9781510618923  
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#### Publication series

Name: Proceedings of SPIE  
Publisher: SPIE-INT SOC OPTICAL ENGINEERING  
Volume: 10683  
ISSN (Print): 0277-786X  
Keywords: Fiber laser, active fiber, fiber amplifier, COMPACT  
Electronic versions:

Fedotov A. High power picosecond MOPA with anisotropic ytterbium-doped tapered double clad fiber  
DOIs:

10.1117/12.2307693

URLs:

<http://urn.fi/URN:NBN:fi:tty-201908211997>

#### Bibliographical note

EXT="Noronen, Teppo"

EXT="Filippov, Valery"

Source: WOS

Source ID: 000450857500033

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### What's inside a rubble pile asteroid? DISCUS - A tomographic twin radar Cubesat to find out

A large fraction of asteroids with diameter  $d > 240$  m are suspected to be loose piles of rocks and boulders bound together mainly by gravity and only weak cohesion. Still to date the size and distribution of voids and monolithic fragments inside these "rubble-piles" are not known. To perform a full tomographic interior reconstruction a bistatic CubeSat configuration has been investigated by Tampere University of Technology (TUT), Radar Systemtechnik GmbH (RST) and the Max Planck Institute for Solar System Research (MPS). The concept is based on two 6U CubeSats, both carrying an identical 1U sized stepped frequency radar. As stepped frequency radars can be built compact, require less power and generate less data volume compared to other radar applications they are well-suited for small satellite platforms. In 2017 the Concurrent Design Facility of ESA/ESTEC conducted two studies relevant for DISCUS. In the Small Planetary Probes (SPP) study DISCUS served as a reference payload for a piggyback mission to a Near-Earth Asteroid (NEA) or even a Main Belt Asteroid (MBA). The M-ARGO study investigated a stand-alone mission to a NEA, with a DISCUS sized instrument. Based on the spacecraft design of SPP and M-ARGO we could prove the instrument requirements as feasible and evaluate our science case from the orbits and mission duration that have been identified by these studies. Using inversion methods developed for medical tomography the data would allow to reconstruct the large scale interior structure of a small body. Simulations have shown that the measurement principle and the inversion method are robust enough to allow full reconstruction of the interior even if the orbits do not cover the entire surface of the asteroid. The measurement results of the mission will help to gain a better understanding of asteroids and the formation mechanisms of the solar system. In addition, the findings will increase the predictability of asteroid impact consequences on Earth and improve future concepts of asteroid deflection.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Computing Sciences, Research group: Inverse Problems, Max Planck Institute for Solar System Research, GomSpace A/S, 3D Profi GmbH, RST Radar Systemtechnik AG, University of Bern, MEW-Aerospace UG, GMV Innovating Solutions S.L, Royal Observatory of Belgium

Contributors: Bambach, P., Deller, J., Martel, J., Vilenius, E., Goldberg, H., Sorsa, L., Pursiainen, S., Takala, M., Wurster, A., Braun, H. M., Lentz, H., Jutzi, M., Wittig, M., Chitu, C. C., Ritter, B., Karatekin, O.

Publication date: 2018

#### Host publication information

Title of host publication: 69th International Astronautical Congress, IAC 2018

#### Publication series

Name: Proceedings of the International Astronautical Congress, IAC

ISSN (Print): 0074-1795

ASJC Scopus subject areas: Aerospace Engineering, Astronomy and Astrophysics, Space and Planetary Science

### **Bibliographical note**

jufoid=85566

Source: Scopus

Source ID: 85065313725

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Mechanisms of disruptive technological change: Case studies in transformation of traditional industries**

The purpose of the manuscript is to use grounded theory building method to investigate three industry contexts that show disruptive innovations based in digital technologies that change the dynamics in industry competition. Specifically, we investigate the mechanisms of disruption in these cases and seek common features of change. Our analysis builds on mechanisms as detecting actors, their properties, and start- and end-states of the system under change and activities of the actors that bring about the change. Our analysis shows common themes that are exhibited throughout all the cases. One of these mechanisms is de-coupling of traditional value chain activities. These de-coupling mechanisms are driven by the formation of innovation ecosystems rather than traditional value chains. This is further accelerated by the emergence of platforms and digital technologies at large. We propose, based on our results, some fundamental mechanisms that are driving industry transformation due to digitalization. We also discuss managerial and theoretical implications of our results in detail.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Center for Innovation and Technology Research

Contributors: Sommarberg, M., Mäkinen, S.

Number of pages: 10

Pages: 1-10

Publication date: 1 Dec 2017

### **Host publication information**

Title of host publication: Proceedings in 2017 Portland International Conference in Management and Engineering (PICMET) : (PICMET) 9-13 July 2017

Publisher: IEEE

ISBN (Electronic): 978-1-890843-36-6

DOIs:

10.23919/PICMET.2017.8125297

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Comparative evaluation of radio propagation properties at 15 GHz and 60 GHz frequencies**

Due to explosive growth in the mobile data demand, millimeter-wave (mmWave) spectrum is to become one of the key enablers for the next-generation 5G wireless. Accurate characterization of mmWave channels has crucial implications on 5G network planning — as compared to more conventional frequency bands — due to a higher impact that surrounding objects have on the radio propagation. In this work, we contribute mmWave channel measurements and compare our obtained results across several metrics of interests, mindful of previously standardized models. The proposed analysis is conducted for a typical mmWave system deployment operating at 15 and 60 GHz. The evaluation studies a difference between the obtained results for the two frequency bands considered, as well as verifies their predictability when utilizing modern modeling considerations.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering, Research group: Emerging Technologies for Nano-Bio-Info-Cogno

Contributors: Solomitckii, D., Semkin, V., Naderpour, R., Ometov, A., Andreev, S.

Number of pages: 5

Pages: 91-95

Publication date: 1 Nov 2017

### **Host publication information**

Title of host publication: 2017 9th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT)

Publisher: IEEE

ISBN (Electronic): 978-1-5386-3435-6

Keywords: 3GPP, Antenna measurements, Delays, Optical attenuators, Optical transmitters, Receiving antennas, channel sounding, mmWave systems, practical measurements, radio propagation, urban deployments

DOIs:

10.1109/ICUMT.2017.8255207

#### Bibliographical note

jufoid=72315

Source: Bibtex

Source ID: urn:e3e92af655321f382b94981bdab749a2

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Upper bound and approximation of random access throughput over chase combining HARQ

Massive MTC (mMTC) scenarios featuring a tremendous number of devices challenge the conventional multiple access protocols, which are mostly based on classic ALOHA algorithms known for their instability at higher loads. While numerous modifications of ALOHA adopt the unrealistic assumption on the fixed number of contending users, we in this paper study a model where a random number of users activate within the slot. In particular, we explore a modification of ALOHA augmented with the Chase combining HARQ (HARQ-CC) and derive an approximation for and a simple upper bound on the system throughput. While the former perfectly matches the corresponding simulation results for the SNR of up to 10dB, the latter constitutes an increasingly tight limit as the SNR grows. Based on both analytical considerations, the resulting system throughput may be significantly improved with the optimal choice of the transmission probability and code spectral efficiency.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering

Contributors: Burkov, A., Matveev, N., Turlikov, A., Bulanov, A., Gahnina, O., Andreev, S.

Number of pages: 5

Pages: 143-147

Publication date: 1 Nov 2017

#### Host publication information

Title of host publication: 2017 9th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT)

Publisher: IEEE

ISBN (Electronic): 978-1-5386-3435-6

Keywords: Decoding, Interference, Nickel, Random variables, Signal to noise ratio, Throughput, Upper bound, ALOHA, Chase combining, Hybrid-ARQ, Random multiple access, system throughput, upper bound

DOIs:

10.1109/ICUMT.2017.8255206

#### Bibliographical note

INT=elt,"Gahnina, O."

jufoid=72315

Source: Bibtex

Source ID: urn:d2e90d5f230392641b73d327cca99a8a

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Multi-factor authentication: A survey and challenges in V2X applications

Today, the digitalization strides tremendously on all the sides of the modern society. One of the enablers to keep this process secure is the authentication. It touches many different areas of the connected world including payments, communications, and access right management. This manuscript attempts to shed the light on the authentication systems' evolution towards Multi-factor Authentication (MFA) from Singlefactor Authentication (SFA) and through Two-factor Authentication (2FA). Particularly, MFA is expected to be utilized for the user and vehicle-to-everything (V2X) interaction which is selected as descriptive scenario. The manuscript is focused on already available and potentially integrated sensors (factor providers) to authenticate the occupant from inside the vehicle. The survey on existing vehicular systems suitable for MFA is given. Finally, the MFA system based on reversed Lagrange polynomial, utilized in Shamir's Secret Sharing (SSS), was proposed to enable flexible in-car authentication. The solution was further extended covering the cases of authenticating the user even if some of the factors are mismatched or absent. The framework allows to qualify the missing factor and authenticate the user without providing the sensitive biometric data to the verification entity. The proposed is finally compared to conventional SSS.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering  
Contributors: Ometov, A., Bezzateev, S.  
Number of pages: 8  
Pages: 129-136  
Publication date: 1 Nov 2017

#### Host publication information

Title of host publication: 2017 9th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT)  
Publisher: IEEE  
ISBN (Electronic): 978-1-5386-3435-6  
Keywords: Authentication, Automobiles, Cryptography, Face recognition, Sensors  
DOIs:  
10.1109/ICUMT.2017.8255200

#### Bibliographical note

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Source: Bibtex  
Source ID: urn:d029c16a781f7c10c219ff994ff0c362  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Wearable e-textile split ring passive UHF RFID tag: Body-worn performance evaluation

We present a wearable e-textile passive UHF RFID tag based on a split ring resonator antenna. The antenna was optimised using a full-wave electromagnetic solver and the prototyped tag was tested in wireless measurements. The detection range of the tag is 2.8 metres at 915 MHz when affixed to the upper back of a person on a textile substrate with the thickness of only two millimetres. In the wireless measurement, we found a close match with the simulations where a homogenous dielectric cuboid representing the torso of a person and studied the impact of non-optimal antenna-body alignments and separations. Overall, the results indicate that the uniplanar split ring antenna achieves robust operation required in the practical wearable applications.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Wireless Identification and Sensing Systems Research Group, BioMediTech  
Contributors: Ma, S., Ukkonen, L., Sydänheimo, L., Björninen, T.  
Publication date: Nov 2017

#### Host publication information

Title of host publication: 2017 IEEE Asia Pacific Microwave Conference (APMC)  
Publisher: IEEE  
ISBN (Print): 978-1-5386-0641-4  
ISBN (Electronic): 978-1-5386-0640-7  
Keywords: Split ring antenna, electro-textile, Wearable antenna, RFID  
Electronic versions:  
submitted paper  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Analysis of Crowdsensed WiFi Fingerprints for Indoor Localization

Crowdsensing is more and more used nowadays for indoor localization based on Received Signal Strength (RSS) fingerprinting. It is a fast and efficient solution to maintain fingerprinting databases and to keep them up-to-date. There are however several challenges involved in crowdsensing RSS fingerprinting data, and these have been little investigated so far in the current literature. Our goal is to analyse the impact of various error sources in the crowdsensing process for the purpose of indoor localization. We rely our findings on a heavy measurement campaign involving 21 measurement devices and more than 6800 fingerprints. We show that crowdsensed databases are more robust to erroneous RSS reports than to malicious fingerprint position reports. We also evaluate the positioning accuracy achievable with crowdsensed databases in the absence of any available calibration.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Automation and Hydraulic Engineering, Research group: Positioning, Tampere University of Technology  
Contributors: Peng, Z., Richter, P., Leppäkoski, H., Lohan, E.  
Number of pages: 10

Pages: 268-277  
Publication date: Nov 2017

#### Host publication information

Title of host publication: Proceedings of the 21st Conference of Open Innovations Association FRUCT  
Place of publication: Helsinki, Finland  
Publisher: FRUCT  
ISBN (Electronic): 978-952-68653-2-4  
Electronic versions:  
CrowdsensedFingerprints03  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201801171105>  
<https://www.fruct.org/publications/fruct21/files/Pen.pdf>

#### Bibliographical note

INT=elt,"Peng, Zhe"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Electrostatic discharge characteristics of conductive polymers

ESD control items are generally characterized by direct current measurements at certain voltage levels. Discharge resistance may, however, have a remarkable voltage and frequency dependency. We have assessed conductive polymers by comparing the resistivities of the solid planar objects with the resistances of electrostatic discharges. Conductive polymers may have applicable characteristics of current attenuation for ESD control items.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Faculty of Biomedical Sciences and Engineering, Cascade Metrology, Premix Oy, Infenion Technologies AG  
Contributors: Viheriäkoski, T., Kärjä, E., Gärtner, R., Tamminen, P.  
Publication date: 18 Oct 2017

#### Host publication information

Title of host publication: Electrical Overstress/Electrostatic Discharge Symposium Proceedings 2017, EOS/ESD 2017  
Publisher: ESD Association  
ISBN (Electronic): 1585372935  
ASJC Scopus subject areas: Electrical and Electronic Engineering  
Source: Scopus  
Source ID: 85037810021  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Qualification challenges of footwear and flooring systems

Measurement of body voltage alone can result in erroneous conclusions in qualification of footwear and flooring systems in combination with a person. Measurement uncertainties should be taken into account. We have studied the time dependency and charge generation of some footwear and flooring systems. The most significant inconsistencies of the voltage measurement are discussed in this technical paper.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Faculty of Biomedical Sciences and Engineering, Cascade Metrology, Sievin Jalkine Oy, Electrostatic Solutions Ltd., Armeka Engineering  
Contributors: Viheriäkoski, T., Jokinen, V., Smallwood, J., Korpipää, A., Tamminen, P.  
Publication date: 18 Oct 2017

#### Host publication information

Title of host publication: Electrical Overstress/Electrostatic Discharge Symposium Proceedings 2017, EOS/ESD 2017  
Publisher: ESD Association  
ISBN (Electronic): 1585372935  
ASJC Scopus subject areas: Electrical and Electronic Engineering  
Source: Scopus  
Source ID: 85037814104  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Indoor Localisation using Aroma Fingerprints: A First Sniff**

Electronic noses (eNoses) can detect and classify a large variety of smells. They are, in general, much more sensitive than the human nose. Could they identify different indoor locations based on the locations' characteristic combinations of airborne chemicals? We study in this paper how well location can be determined in an indoor environment using only measurements from an ion mobility spectrometry eNose and a K nearest neighbour (KNN) classifier. Based on the results of test with real-world data eNose-based localisation seems to have potential but there are several questions and issues that still have to be addressed. This paper provides therefore a discussion of questions and issues that have to be studied in the future, and proposes potential solutions.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Mathematics, Research area: Microsystems, Research group: Sensor Technology and Biomeasurements (STB), Automation and Hydraulic Engineering

Contributors: Müller, P., Lekkala, J., Ali-Löytty, S., Piche, R.

Publication date: Oct 2017

#### **Host publication information**

Title of host publication: 2017 14th Workshop on Positioning, Navigation and Communications (WPNC)

Place of publication: Bremen, Germany

Publisher: IEEE

ISBN (Electronic): 978-1-5386-3089-1

Electronic versions:

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DOIs:

10.1109/WPNC.2017.8250046

URLs:

<http://urn.fi/URN:NBN:fi:tty-201711162161>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Rational Number Knowledge Assessment and Training With a Game Competition**

Raising awareness of educational games and game-based learning is an important step for large-scale adoption of these new educational methods. Digital game-based learning provides unique opportunities to engage students in learning, which is especially important for subjects that students struggle with, such as mathematics. Therefore, the aim of the current paper was to evaluate the usefulness of a math game competition for engaging, assessing, and training rational numbers in students from different schools. In particular, we investigated whether playing a digital game would improve students'

magnitude understanding of rational numbers and whether playing behavior can be used for assessment purposes.

Finnish fourth ( $n = 59$ ;  $Mage = 10.36$ ) and sixth-graders ( $n = 105$ ;  $Mage = 12.34$ ) participated in a math game competition relying on intra-classroom cooperation and inter-classroom competition. The students played a digital rational number game called Semideus, which is founded on number line estimation task mechanics in which players have to estimate the spatial position of a target number on a number line with only its start and endpoint specified. In previous empirical studies, this task mechanic has been successfully used to assess and foster students number magnitude understanding in conventional non-game based settings. Consequently, students were allowed to play the game as much as they wanted during a three-week period in order to improve their rational number knowledge and were able to check the status of the competition online. As expected, sixth grade students performed more accurately than fourth grade students in the game-based rational number magnitude estimation tasks. Moreover, results indicated that students benefited significantly from participating in the math game competition with respect to rational number knowledge. Importantly, the Semideus game was particularly effective with students who started with less rational number knowledge. Overall, the study demonstrated that participation in a math game competition seems to be a useful and engaging approach to assess and support the development of students' rational number knowledge.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, Research group: TUT Game Lab

Contributors: Kiili, K., Ojansuu, K., Lindstedt, A., Ninaus, M.

Pages: 320-327

Publication date: Oct 2017

#### **Host publication information**

Title of host publication: Proceedings of The 11th European Conference on Game-Based Learning ECGBL 2017

Publisher: Academic Conferences and Publishing International Limited

ISBN (Electronic): 978-1-911218-57-9

Keywords: Rational numbers, Game-based learning, Competition, Assessment, Number line

Electronic versions:

Rational Number Knowledge Assessment and Training With a Game Competition

URLs:

<http://urn.fi/URN:NBN:fi:tty-201901221136>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Embroidered antennas and antenna-electronics interfaces for wearable RFID tags**

We summarize the possibilities of embroidery with conductive yarn in the fabrication of antennas and antenna-electronics interconnections for wearable RFID tags. Based on our results, both fabrication time and amount of conductive yarn used in fabrication of a dipole antenna can be saved by selecting dense or parse stitching for different regions of the antenna, or by sewing only the antenna borderline. Moreover, we fabricated the antenna-IC interconnection by sewing through the pads of the fixture carrying the IC during the antenna fabrication. Our wearable prototype tag showed excellent wireless performance, and was detectable at distances of 6 and 2 meters, in air and on the human body, respectively.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Wireless Identification and Sensing Systems Research Group

Contributors: Virkki, J., Chen, X., Björninen, T., Ukkonen, L.

Number of pages: 3

Publication date: 20 Sep 2017

#### **Host publication information**

Title of host publication: IMWS-AMP 2017 International Microwave Workshop Series on Advanced Materials and Processes

Publisher: IEEE

ISBN (Print): 978-1-5386-0480-9

DOIs:

10.1109/IMWS-AMP.2017.8247437

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Knowledge sharing in knowledge collectivity: case digitalization in industrial network**

Knowledge sharing (KS) in the inter-organizational setting is not widely researched area. However, in temporary organizations such as projects, sharing expert knowledge is essential and may take place in knowledge collectivities, i.e., Collectivities of Practices (CIP). Due to CIPs' often temporary nature, time and socialization are lacking, thus efficient KS practices are required. The complexity of projects may also necessitate CIPs to cross organization boundaries, forming inter-organizational CIPs, IO-CIPs. Therefore, a better understanding of intra-organizational practices overlapping inter-organizational KS is called for. This paper contemplates on who should participate and how the process of boundary spanning KS should be put into practice in IO-CIP context. We present a case of a network-dependent focal company aiming to form a new digitalization strategy, which requires boundary-spanning knowledge management (KM) approaches. We concentrate both on intra- and inter-organizational steps needed for developing a digitalization roadmap eventually encompassing the whole network. Based on case observations we conclude that KS in industrial IO-CIP context involves multiple internal and external stakeholders, which also play facilitating roles in KS process. The results also reveal that it is possible to achieve KS in a larger group with a stepwise, well-facilitated and goal-oriented approach that involves experts into practices gradually. Additionally, complex phenomena in industrial networks, such as digitalization, requires other processes of KM besides KS: knowledge transfer for explicit knowledge and knowledge creation at the network level, too. Thus, in IO-CIP setting, KM processes of the company and network should be approached holistically, aiming at an overall view. The results shed light on KS in inter-organizational setting, particularly the overlap between intra-organizational practices and inter-organizational KS within knowledge collectivities. We contribute to boundary spanning inter-organizational KS by adding a description of the KS practices in CIPs, which is based on the theory of social constructivism of knowledge, and expand the viewpoint of the CIP-concept also towards inter-organizational setting.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Business Ecosystems, Networks and Innovations, Industrial and Information Management

Contributors: Suominen, A. H., Mäenpää, S.

Number of pages: 8

Pages: 956-963

Publication date: 7 Sep 2017



### Host publication information

Title of host publication: Proceedings of the 18th European Conference on Knowledge Management ECKM 2017 : 7-8 September 2017, Barcelona, Spain

Publisher: Academic Conferences and Publishing International

Editors: Marimon, F., Mas-Machuca, M., Berbegal-Mirabent, J., Bastida, R.

ISBN (Print): 978-1-911218-48-7

ISBN (Electronic): 978-1-911218-49-4

ASJC Scopus subject areas: Business, Management and Accounting(all)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Tuning extrinsic noise effects on a small genetic circuit

Measurements at the single cell level showed that monoclonal Escherichia coli cells differ widely in the numbers of components affecting gene expression dynamics. Using a stochastic model of a 2-genes symmetric toggle switch with realistic multi-step promoter initiation kinetics and empirically validated parameter values, we investigate the role of transcription initiation kinetics on the degree with which cell-to-cell variability in cellular components generates cell-to-cell diversity in switch dynamics. We find that while the mean switching frequency is determined by the promoter kinetics, the cell to cell diversity of this frequency depends both on promoter kinetics and diversity in RNA polymerase numbers. At a microscale level, the main regulator of the cell to cell variability in protein numbers (of both genes in ON and OFF states) is the promoters kinetics, not the diversity in RNA polymerase numbers. We conclude that the promoters kinetics is a critical regulator of the toggle switch dynamics and that can be used as a regulatable filter of extrinsic noise.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Laboratory of Biosystem Dynamics-LBD

Contributors: Mohamed Bahrudeen, M., S. Ribeiro, A.

Publication date: 4 Sep 2017

### Host publication information

Title of host publication: Proceedings of ECAL 2017 : 14th European Conference on Artificial Life

Publisher: Massachusetts Institute of Technology

ISBN (Electronic): 978-0-262-34633-7

Electronic versions:

Tuning extrinsic noise effects on small genetic circuit

DOIs:

10.7551/ecal\_a\_075

URLs:

<http://urn.fi/URN:NBN:fi:ty-201711232256>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Printed soft-electronics for remote body monitoring

Wearable electronics has emerged into the consumer markets over the past few years. Wrist worn and textile integrated devices are the most common apparatuses for unobtrusive monitoring in sports and wellness sectors. Disposable patches and bandages, however, represent the new era of wearable electronics. Soft and stretchable electronics is the enabling technology of this paradigm shift. It can conform to temporary transfer tattoo and deform with the skin without detachment or fracture. In this paper, we focus on screen-printed soft-electronics for remote body monitoring. We will present a fabrication process of a skin conformable electrode bandage designed for long-term outpatient electrocardiography (ECG) monitoring. The soft bandage is designed to be attached to the patient chest and miniaturized data collection device is connected to the bandage via Micro-USB connector. The fabricated bandage is tested in short exercise as well as continued long-term (72 hours) monitoring during normal daily activities. The attained quality of the measured ECG signals is fully satisfactory for rhythm-based cardiac analysis also during moderate-intensity exercise. After pre-processing, the signals could be used also for more profound morphological analysis of ECG wave shapes.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering, Faculty of Biomedical Sciences and Engineering

Contributors: Mäntysalo, M., Vuorinen, T., Jeyhani, V., Vehkaoja, A.

Number of pages: 7

Publication date: Aug 2017

### Host publication information

Title of host publication: Hybrid Memory Devices and Printed Circuits 2017 : SPIE Organic Photonics + Electronics | 6-10 August 2017

Publisher: SPIE

### Publication series

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ISSN (Electronic): 1996-756X

Electronic versions:

Printed\_soft\_electronics\_for\_remote\_body\_monitoring

DOIs:

10.1117/12.2275606

URLs:

<http://urn.fi/URN:NBN:fi:tty-201801301174>

### Bibliographical note

jufoid=71479

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Who is who in Big Social Data? A Bibliographic Network Analysis Study

The aim of the study is to investigate who are advancing the knowledge on Big Social Data and the related concept of Social Big Data, 'who' are these people citing and building their work on, and what are the topics and outlets where the discussion takes place. For that purpose, data was extracted from Thomson Reuters Web of Science with the search term "Big Social Data" and "Social Big Data" spanning the years from 2012 to 2016. The search resulted in 58 articles in 39 different outlets. In order to go into the depth of Big Social Data and Social Big Data, co-author bibliographic network analysis was performed on the extracted data. The co-author network analysis revealed 149 nodes (authors), and 308 edges (co-authoring relationships) between the authors. Betweenness centrality were calculated for the nodes to demonstrate who are the central authorities and their domain on the topic of Big Social Data and Social Big Data. The visualisation based on co-author network analysis provides insight into the possible clusters of authors in the topics of Big Social Data and Social Big Data. Co-citation analysis was performed for the combined network of Big Social Data and Social Big Data authors. This study was carried out using Ostinato process model for visual network analysis. The findings of the

study provide insights on the leading authorities (authors) advancing the knowledge in Big Social Data. From the community of Big Social Data three authoritative clusters were identified, one with authors located in Singapore and Scotland, another with authors located in Denmark, and third based in London, England. The Social Big Data communities were mainly located in Asia, with two authoritative clusters, one located in Japan, and another with authors located in South-Korea and Spain. The topic modelling uncovered that the themes discussed in Big Social Data and Social Big Data communities were fairly similar, dealing with analysis of social media data in various ways. Most commonly the focus was on Twitter or Facebook data analysis. Further, the bibliometric analysis provides an indication for potential outlets (Journals and Conferences) for Big Social Data and Social Big Data themed articles, as well as, their impact on the field.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Business Data Research Group

Contributors: Jussila, J., Menon, K., Gupta, J., Kärkkäinen, H.

Pages: 161-169

Publication date: 3 Jul 2017

### Host publication information

Title of host publication: Proceedings of the 4th European Conference on Social Media ECSM 2017

Volume: 4

Place of publication: Reading, UK

Publisher: Academic Conferences and Publishing International Limited

ISBN (Print): 978-1-911218-46-3

ISBN (Electronic): 978-1-911218-47-0

ASJC Scopus subject areas: Computer Science(all)

Keywords: social media

Electronic versions:

Who is who in Big Social Data? A Bibliographic Network Analysis Study

URLs:

<http://urn.fi/URN:NBN:fi:tty-201802141223>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Applying third-party moocs in programming education: a case study

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Software Engineering and Intelligent Systems, Research group: Software Engineering and Intelligent Systems, Pervasive Computing

Contributors: Saari, M., Mäkinen, T., Linna, P.

Number of pages: 7

Pages: 53-59

Publication date: 3 Jul 2017

### Host publication information

Title of host publication: 9th International Conference on Education and New Learning Technologies : 3-5 July, 2017  
Barcelona, Spain

Place of publication: Barcelona, Spain

Publisher: IATED

ISBN (Electronic): 978-84-697-3777-4

DOIs:

10.21125/edulearn.2017.1014

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Maximally Flat Property and Bandwidth Enhancing by Transfer Function Zeroes IEEE-NewCAS France

The paper describes an extension, at the approximation level, of shunt-peaking technique to increase the filter/amplifier bandwidth. The frequency dependent square modulus of transfer function is multiplied by a polynomial of squared frequency. Using a standard procedure of restoration one finds the new transfer function which is the result of multiplication of initial transfer function by the zeros defined by this polynomial of squared frequency. This new transfer function is characterized by a faster step-transient response of smaller delay and lower overshoot in comparison with initial function which did not include the zeros. An example of sixth order Butterworth filter is considered to demonstrate the modifications of step-transient response depending on the number of zeros. The procedure can also result in pole-zero cancellation simplifying the transfer function for given step-transient response.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering

Contributors: Filanovsky, I., Tchamov, N.

Publication date: 25 Jun 2017

### Host publication information

Title of host publication: 2017 15th IEEE International New Circuits and Systems Conference (NEWCAS)

Publisher: IEEE

ISBN (Electronic): 978-1-5090-4991-2

DOIs:

10.1109/NEWCAS.2017.8010113

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## On the prospects of full-duplex military radios

In-band full-duplex (FD) operation can be regarded as one of the greatest discoveries in civilian/commercial wireless communications so far in this century. The concept is significant because it can as much as double the spectral efficiency of wireless data transmission by exploiting the new-found capability for simultaneous transmission and reception (STAR) that is facilitated by advanced self-interference cancellation (SIC) techniques. As the first of its kind, this paper surveys the prospects of exploiting the emerging FD radio technology in military communication applications as well. In addition to spectrally efficient two-way data transmission, the STAR capability could give a major technical advantage for armed forces by allowing their radio transceivers to conduct electronic warfare at the same time when they are also receiving or transmitting information signals at the same frequency band. After providing a detailed introduction to FD transceiver architectures and SIC requirements in military communications, this paper outlines and analyzes some potential defensive and offensive applications of the STAR capability.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Aalto University

Contributors: Riihonen, T., Korpi, D., Rantula, O., Valkama, M.

Publication date: 23 Jun 2017

#### Host publication information

Title of host publication: 2017 International Conference on Military Communications and Information Systems, ICMCIS 2017

Publisher: IEEE

ISBN (Electronic): 9781538638583

ASJC Scopus subject areas: Computer Networks and Communications, Hardware and Architecture, Information Systems  
DOIs:

10.1109/ICMCIS.2017.7956490

Source: Scopus

Source ID: 85025684140

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Morphology Development, Structure and Dielectric Properties of Biaxially Oriented Polypropylene

This paper outlines our recent study on effects of cast film extrusion and biaxial orientation on the morphological development and dielectric performance of biaxially oriented polypropylene (PP) films based on two capacitor-grade isotactic PP (iPP) raw materials. Results on polymorphic composition, melting behavior, microstructure and dielectric properties are reported. Morphological development during film manufacturing is found to have a profound effect on film structure and dielectric characteristics. Formation of structural defects was traced back to  $\beta \rightarrow \alpha$  crystal transformation upon biaxial stretching.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electrical Energy Engineering, Research area: Power engineering, Research group: High voltage engineering, Borealis Polyolefine GmbH, VTT Tech Res Ctr Finland, VTT Technical Research Center Finland

Contributors: Rytöluoto, I., Ritamäki, M., Gitsas, A., Pasanen, S., Lahti, K.

Number of pages: 6

Publication date: 18 Jun 2017

#### Host publication information

Title of host publication: 25th Nordic Insulation Symposium on Materials, Components and Diagnostics

#### Publication series

Name: Proceeding of the Nordic Insulation Symposium

No.: 25

ISSN (Electronic): 2535-3969

Electronic versions:

n2017-s03p01\_Rytoluoto

URLs:

<https://www.ntnu.no/ojs/index.php/nordis/article/view/2359/2200>

<http://urn.fi/URN:NBN:fi:tyy-201710031980>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### The role of inorganics in modelling of biomass gasification

In this work, a summary of the research carried out about the role of inorganic elements in biomass gasification is presented. The research work has focused on the catalytic effects of alkali and alkaline earth metals in char gasification. The work has included gasification experiments using thermogravimetric analysis (TGA) and fluidized beds as well as modeling techniques. The results of the research presented in this paper indicate that the laboratory measured TGA reactivity numbers and correlations (including the effect of fuel ash inorganics) are possible to be converted to numbers predicting carbon conversion in a large scale fluidized bed gasification reactor. The model, called Carbon Conversion Predictor, is a relatively simple and transparent tool for the comparison of the gasification reactivity of different fuels in fluidized bed gasification.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Chemistry and Bioengineering, Research group: Bio- and Circular Economy, Univ Seville, University of Sevilla, Chem & Environm Engn Dept, Bioenergy Grp, Escuela Super Ingenieros, Åbo Akademi University, Process Chemistry Center

Contributors: Konttinen, J., Kramb, J., DeMartini, N., Gomez-Barea, A.

Number of pages: 5

Pages: 443-447

Publication date: 13 Jun 2017

### Host publication information

Title of host publication: EUBCE 2017 Online Conference Proceedings  
Publisher: ETA-Florence Renewable Energies  
Editors: Ek, L., Ernrooth, H., Scarlat, N., Grassi, A., Helm, P.  
ISBN (Electronic): 978-88-89407-17-2

### Publication series

Name: European biomass conference and exhibition proceedings  
Publisher: ETA Florence renewable energies  
ISSN (Electronic): 2282-5819  
DOIs:

10.5071/25thEUBCE2017-2BO.6.4

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Managing intellectual liabilities by service recovery

Purpose – The paper studies intangible liabilities in a practical management setting with an overall aim to develop better managerial practices to avoid depreciation of organizations' intangible assets.

Design/methodology/approach – Empirical examination of the studied phenomenon was carried out in construction industry. Empirical data was gathered in two phases. First, 16 persons engaged to customer service in four construction companies were interviewed. The purpose was to identify intangible liabilities. After the interviews, two workshops in two companies were organized to reflect findings and to improve and develop organizations' service recovery practices.

Originality/value – The novelty value of the suggested approach lies in cross-disciplinary consideration of customer experience as an antecedent of various processes that may have negative impact on organizations' intellectual capital, and further on performance. The paper conceptualizes the hidden renewal capability of contradictory and negative customer experiences by analyzing their potential implications on IC, especially in relational capital.

Practical implications – Contributions of the paper relate to its practical research approach and focus on relational liabilities. The paper provides new understanding about intellectual liabilities within a certain industrial context and discusses more generalizable aspects to be considered in managing intellectual capital.

Keywords – Intellectual liabilities, Intellectual capital, Service recovery, Customer satisfaction

Paper type – Academic Research Paper

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Knowledge and Learning Research Center, Research group: Business Data Research Group, University of Tampere

Contributors: Laihonon, H., Sillanpää, V., Vuolle, M.

Number of pages: 14

Pages: 1570-1583

Publication date: 9 Jun 2017

### Host publication information

Title of host publication: Proceedings IFKAD 2017, 12th International Forum on Knowledge Asset Dynamics : Knowledge Management in the 21st Century: Resilience, Creativity and Co-creation, 7-9 Jun 2017, St. Petersburg, Russia.

Publisher: IKAM - Institute of Knowledge Asset Management

Editors: Schiuma, G., Spender, J., Garvilova, T.

ISBN (Electronic): 978-88-96687-10-9

### Publication series

Name: Proceedings IFKAD

ISSN (Print): 2280-787X

ASJC Scopus subject areas: Business, Management and Accounting(all)

Keywords: Intellectual liabilities, Intellectual capital, Service recovery, Customer satisfaction

URLs:

[http://www.ifkad.org/Proceedings/2017/papers/264\\_IFKAD2017.pdf](http://www.ifkad.org/Proceedings/2017/papers/264_IFKAD2017.pdf)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## If you know social media, you see opportunities...

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Business Ecosystems, Networks and Innovations, Industrial and Information Management , Research group: Business Data Research Group

Contributors: Aramo-Immonen, H., Vartio, M., Jussila, J.

Pages: 575-584

Publication date: 7 Jun 2017

### Host publication information

Title of host publication: 12th International Forum on Knowledge Asset Dynamics : Knowledge Management in the 21th Century: Resilience, Creativity and Co-creation

Volume: 12

ISBN (Electronic): 978-88-96687-10-9

Keywords: social media

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## A bibliometric study on authorship trends and research themes in knowledge management literature

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Business Data Research Group, Research group: Business Ecosystems, Networks and Innovations, Research group: Knowledge and Learning Research Center, University of Exeter, Lappeeranta University of Technology

Contributors: Jussila, J. J., Mustafee, N., Aramo-Immonen, H., Menon, K., Hajikhani, A., Helander, N.

Number of pages: 9

Pages: 389-397

Publication date: 7 Jun 2017

### Host publication information

Title of host publication: 12th International Forum on Knowledge Asset Dynamics, St. Petersburg, Russia 7-9 June 2017 : Knowledge Management in the 21th Century: Resilience, Creativity and Co-creation

Volume: 12

Place of publication: St. Petersburg, Russia

ISBN (Electronic): 978-88-96687-10-9

Keywords: bibliometrics

URLs:

<http://www.ifkad.org/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## Why don't one maximizes database utilization in product and service development in manufacturing?

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Business Ecosystems, Networks and Innovations

Contributors: Väyrynen, H., Manu, M.

Number of pages: 13

Pages: 93-105

Publication date: 7 Jun 2017

### Host publication information

Title of host publication: Proceedings of the 12th International Forum on Knowledge Asset Dynamics 2017 : St. Petersburg, Russia, 7-9 June 2017

Place of publication: St. Petersburg, Russia

ISBN (Print): 978-88-96687-10-9

### Publication series

Name: Proceedings IFKAD

ISSN (Print): 2280-787X

Keywords: Technology adoption, DATABASE, customer oriented approach, Practice, Development

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Advocator, jester, spokesperson, provocateur and boundary spanner? Exploring different communication styles at twitter**

**Purpose** – The recent development of digital communication technologies, and of social media in particular, have enhanced more direct communications between companies and their customers. Among many other things, the use of social media has become considerably popular in customer services. However, communicating with different types of customers is not easy. More profound understanding is needed about how to succeed in communicating with the customers in the increasingly impersonal, yet often emotionally sensitive online environments.

**Design/methodology/approach** – Based on an extensive empirical data from Twitter discussions on climate change and energy industry, the analysis will follow the ideas and concepts of research on personalities and motivation in the context of social media.

**Originality/value** – By theorising the impacts of human personality traits to a person's communication style in social media, in accordance with the person's own choices of roles and motivations to communicate in social media, this study will provide companies new insight on how to approach their customers in online environments.

**Practical implications** – This study offers significant information for any company that wants to improve their customer service through social media. That is, by presenting the early phase taxonomy for different social media communication styles used in Twitter, this study will provide companies with both new insight and practical advice on how to better share information and manage discussions on their social media channels, considering the different communications styles of their customers.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Turku University of Applied Science

Contributors: Ketonen-Oksi, S., Jalonen, H.

Publication date: 6 Jun 2017

#### **Host publication information**

Title of host publication: 12th Conference proceedings of IFKAD2017 : St.Petersburg, Russia, 7-9 June 2017

ISBN (Print): 978-88-96687-10-9

#### **Publication series**

Name: Proceedings IFKAD

ISSN (Print): 2280-787X

Keywords: Social Media, Uses and Gratifications Theory, Twitter, Big Five

URLs:

[http://www.harrijalonen.fi/files/files/IFKAD%20final%209\\_4\\_2017\\_ok\\_ok.pdf](http://www.harrijalonen.fi/files/files/IFKAD%20final%209_4_2017_ok_ok.pdf)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Customer Perceived Value - A Key in Marketing of Integrated Solutions**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Knowledge and Learning Research Center,

Research group: Novi

Contributors: Helander, N., Sillanpää, V., Vuori, V., Uusitalo, O.

Pages: 37-42

Publication date: 3 Jun 2017

#### **Host publication information**

Title of host publication: The 5th International Conference on Strategic Innovative Marketing., At Athens, Greece, Volume: 5 : September 23-26, 2016

Publisher: Springer

Editors: Kavoura, A., Sakas, D., Tomaras, P.

ISBN (Electronic): 978-3-319-56288-9

#### **Publication series**

Name: Springer Proceedings in Business and Economics

ISSN (Print): 2198-7246

Electronic versions:

Integrated solutions

DOIs:

10.1007/978-3-319-56288-9\_6

URLs:

<http://urn.fi/URN:NBN:fi:tuni-201910033684>

URLs:

<http://www.icsim.net/>

### **Bibliographical note**

jufoid=84314

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Reliability and Perceived Value of Sentiment Analysis for Twitter Data**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Managing digital industrial transformation (mDIT), Industrial and Information Management, Research group: Business Data Research Group, Research group: Knowledge and Learning Research Center, University of Vaasa, University of Tampere

Contributors: Jussila, J., Vuori, V., Okkonen, J., Helander, N.

Pages: 43-48

Publication date: 3 Jun 2017

### **Host publication information**

Title of host publication: 5th International Conference on Strategic Innovative Marketing, At Athens, Greece, : September 23-26, 2016

Publisher: Springer

Editors: Kavoura, A., Sakas, D., Tomaras, P.

ISBN (Electronic): 978-3-319-56288-9

### **Publication series**

Name: Springer Proceedings in Business and Economics

ISSN (Print): 2198-7246

Electronic versions:

Reliability and perceived value

DOIs:

10.1007/978-3-319-56288-9\_7

URLs:

<http://urn.fi/URN:NBN:fi:tuni-201910033678>

URLs:

<http://www.icsim.net/>

### **Bibliographical note**

jufoid=84314

EXT="Vuori, Vilma"

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Social Media Analytics Empowering Customer Experience Insight**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Managing digital industrial transformation (mDIT), Industrial and Information Management, Research group: Business Data Research Group, Research group: Knowledge and Learning Research Center, Tampere University of Applied Science, Turku University of Applied Science

Contributors: Jussila, J., Boedeker, M., Jalonen, H., Helander, N.

Pages: 25-30

Publication date: 3 Jun 2017

### **Host publication information**

Title of host publication: 5th International Conference on Strategic Innovative Marketing, Volume: 5 : September 23-26, 2016 At Athens, Greece

Publisher: Springer



Editors: Kavoura, A., Sakas, D., Tomaras, P.  
ISBN (Electronic): 978-3-319-56288-9

#### Publication series

Name: Springer Proceedings in Business and Economics  
ISSN (Print): 2198-7246  
URLs:  
<http://www.icsim.net/>

#### Bibliographical note

jufoid=84314

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Managing different types of changes during the lifecycle of a complex delivery project

Delivery projects are a way for a project contractor to solve a customer's need by delivering a customer-specific tailored solution. The success of these delivery projects is focal for both the project contractor and the customer. One way for the project contractor to promote the success of a delivery project is to plan the project well and to follow a project management methodology. However, despite the planning efforts and project management methodologies, various changes typically take place throughout the project lifecycle. There can be changes both compared to the plans and to the project management methodology and this article focuses on both types of changes and change management in delivery projects. The findings of a case study research reveal, how changes take place throughout the lifecycle of a delivery project, how there are external and internal reasons behind the changes and how both change management activities and improvisational actions are taken by project personnel to manage the changes. The findings also highlight the customer's role as a source for changes and the different personnel's role in performing either the change management activities or the improvisational actions. The findings of the study are discussed in relation to the literature on changes and change management in projects and to the literature on improvisation in projects.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Industrial and Information Management, Research group: Center for Research on Operations Projects and Services  
Contributors: Vuorinen, L., Martinsuo, M.  
Number of pages: 33  
Publication date: Jun 2017

#### Host publication information

Title of host publication: The 2017 European Academy of Management (EURAM) Conference : Glasgow, Scotland, 21-24 June, 2017.  
Publisher: EURAM  
URLs:  
<http://euramonline.org/annual-conference-2017-2.html>  
<http://euramonline.org/annual-conference-2016/faq-conference-16.html>  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Visual Data Mining in Software Repositories: A Survey

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Pervasive Computing  
Contributors: Eteläaho, A., Soini, J., Jaakkola, H., Mattila, A.  
Pages: 367-385  
Publication date: Jun 2017

#### Host publication information

Title of host publication: The Proceedings of the 27th International Conference on Information Modelling and Knowledge Bases  
Publisher: Sirindhorn International Institute of Technology, Thammasat University, Thailand  
Editors: Sornlerlamvanich, V., Chawakitchareon, P., Hansuebsai, A., Koopipat, C., Kiyoki, Y., Jaakkola, H., Thalheim, B., Yoshida, N.  
ISBN (Electronic): 978-616-407-165-0  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## Culture-Aware Web Information Systems in Dependence of Context

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, Christian-Albrechts-University Kiel

Contributors: Jaakkola, H., Thalheim, B.

Pages: 309-331

Publication date: Jun 2017

### Host publication information

Title of host publication: The Proceedings of the 27th International Conference on Information Modelling and Knowledge Bases

Publisher: Sirindhorn International Institute of Technology, Thammasat University, Thailand

Editors: Sornlertlamvanich, V., Chawakitchareon, P., Hansuebsai, A., Koopipat, C., Kiyoki, Y., Jaakkola, H., Thalheim, B., Yoshida, N.

ISBN (Electronic): 978-616-407-165-0

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### The logics taught and used at high schools are not the same

Typical treatises on propositional and predicate logic do not tell how to deal with undefined expressions, such as division by zero. However, there seems to be a sound (albeit inexplicit) reasoning system that addresses undefined expressions, because equations and inequations involving them are routinely solved in schools and universities without running into fundamental inconsistencies. In this study we discover this school logic and formalize its semantics. The need to do so arose when developing software that gives students feedback on every reasoning step of their solution, instead of just telling whether the roots that they finally report are the correct roots. The problem of undefined expressions has been addressed in computer science. However, school logic proves different from those approaches. School logic is based on a Kleene-style third "undefined" truth value and the treatment of " $\Rightarrow$ " and " $\Leftrightarrow$ " not as propositional operators but as reasoning operators.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, University of Tampere

Contributors: Valmari, A., Hella, L.

Number of pages: 15

Pages: 172-186

Publication date: May 2017

### Host publication information

Title of host publication: Proceedings of the Fourth Russian Finnish Symposium on Discrete Mathematics

Place of publication: Turku

Publisher: TURKU CENTRE FOR COMPUTER SCIENCE

Editors: Karhumäki, J., Matiyasevich, Y., Saarela, A.

ISBN (Print): 978-952-12-3547-4

### Publication series

Name: TUCS Lecture Notes

Publisher: Turku Centre for Computer Science

No.: 26

ISSN (Print): 1797-8823

ASJC Scopus subject areas: Mathematics(all)

Keywords: logic

URLs:

<http://www.doria.fi/handle/10024/143322>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Instrumentation and monitoring of large-span culvert built under a railway, in Finland

Large span soil-steel culverts are rarely used in Finland as vehicular under-passes. The large span and low soil cover height together with high traffic loads place high demands on the construction of culvert backfills. Traffic-induced stress changes and the fatigue resistance of the plates play a major role in the endurance of a culvert. According to design calculations, the most critical section of the culvert is the crown. For this reason, the focus of this project is on the assessment of the structural behaviour and performance of the crown area under influence of traffic load. The structural performance of the culvert was verified by monitoring stress changes and deformations under live railway traffic, which

proved the suitability of the multi-plated culvert built under a railway.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Civil Engineering, Research group: Vaativat rakenteet  
Contributors: Asp, O., Laaksonen, A.  
Number of pages: 8  
Pages: 53-60  
Publication date: 24 Apr 2017

#### Host publication information

Title of host publication: Archives of Institute of Civil Engineering : 3rd European Conference on Buried Flexible Steel Structures, Rydzyna, Poland, 24-25 April 2017  
Volume: 2017  
Place of publication: Poznan  
Publisher: Wydawnictwo Politechniki Poznanskiej  
Editors: Madaj, A., Jankowiak, I.  
Edition: 23  
DOIs:  
10.21008/j.1897-4007.2017.23.05  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### HEVC-compliant viewport-adaptive streaming of stereoscopic panoramic video

Virtual reality (VR) provides unprecedented immersive experience using high-resolution spherical stereoscopic panoramic video. Such an experience is achieved by using head-mounted display (HMD) which has very strict latency bounds in order to respond promptly to user movements. Conventional streaming of VR video requires large bandwidth because the entire captured panorama is transmitted. However, only a limited field-of-view (FOV) is displayed by an HMD, resulting in wastage of bandwidth. To alleviate the problem, this paper proposes a High Efficiency Video Coding (HEVC) compliant approach for efficient coding and streaming of stereoscopic VR content. The proposed method is based on partitioning video pictures into tiles, where only the required tiles corresponding to the primary viewport are transmitted in high resolution, while the remaining parts are transmitted in low resolution. Furthermore, this method enables coding stereoscopic video contents using a conventional HEVC codec, while still achieving significant compression gain by means of adopting inter-view prediction only in intra random access point (IRAP) pictures. Using this method, the predicted view can be decoded independently of the main view, hence allowing simultaneous decoding instances. Experimental results demonstrate that the proposed approach is able to substantially improve compression efficiency and streaming bitrate performance.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Signal Processing, Research group: Multimedia Research Group - MRG, Nokia  
Contributors: Zare, A., Sreedhar, K. K., Vadakital, V. K. M., Aminlou, A., Hannuksela, M. M., Gabbouj, M.  
Publication date: 19 Apr 2017

#### Host publication information

Title of host publication: 2016 Picture Coding Symposium, PCS 2016  
Publisher: IEEE  
ISBN (Electronic): 9781509059669  
ASJC Scopus subject areas: Media Technology, Signal Processing  
DOIs:  
10.1109/PCS.2016.7906401

#### Bibliographical note

EXT="Vadakital, Vinod Kumar Malamal"  
Source: Scopus  
Source ID: 85019449939  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Towards better knowledge work experiences with new Ambient workspace: Concept and prototype

This paper presents a conceptual design of a dynamic and personalizable knowledge workspace suitable for collaboration in academic contexts. The concept of such workspace is aimed to cater the needs of students-As knowledge workers-for flexibility in various types of group and individual knowledge tasks. The research is focused on revealing challenges and obstacles faced by students who perform their daily knowledge work in current workspaces at various premises of Finnish campus. We propose solution that utilizes information technology and interior design. Based on literature on Ambient Intelligence and knowledge work, as well as our empirical user research, we designed a concept of flexible, transformable

and user-friendly campus workspace with various features and functionalities. The concept is presented through visualizations and a semi-functional three-dimensional cardboard prototype. The workspace design itself is the main contribution of the current research. Dynamism, flexibility, personalization as well as features of the physical and mental engagement are principal novelties of proposed workspace for university students.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, Electronics and Communications Engineering

Contributors: Olshannikova, E., Ometov, A., Anagnostaki, T., Hasan, N., Kuketaeva, A., Ahtinen, A., Olsson, T., Koucheryavy, Y.

Number of pages: 9

Pages: 173-181

Publication date: 4 Apr 2017

#### Host publication information

Title of host publication: Proceedings of the 19th Conference of Open Innovations Association, FRUCT 2016

Publisher: IEEE COMPUTER SOCIETY PRESS

ISBN (Electronic): 9789526839752

ASJC Scopus subject areas: Computer Science(all), Electrical and Electronic Engineering

DOIs:

10.23919/FRUCT.2016.7892198

Source: Scopus

Source ID: 85018626230

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Wirelessly powered implantable system for wireless long-term monitoring of intracranial pressure

This paper presents the pressure readout results from a piezoresistive pressure sensor in a biological environment mimicking the human head properties for intracranial pressure (ICP) monitoring application. The piezoresistive pressure sensor is wirelessly powered through inductively coupled antennas. After successful activation of the sensor, the pressure readout is demonstrated from 0 mmHg to 30 mmHg with a resolution of one mmHg.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research area: Dynamic Systems, Research group: Wireless Identification and Sensing Systems Research Group

Contributors: Khan, M. W. A., Björninen, T., Sydänheimo, L., Ukkonen, L.

Pages: 122-124

Publication date: 1 Mar 2017

#### Host publication information

Title of host publication: Proceedings of IEEE 2017 International Workshop on Antenna Technology

Publisher: IEEE

ISBN (Electronic): 978-1-5090-5176-2

Electronic versions:

8572183

DOIs:

10.1109/IWAT.2017.7915334

URLs:

<http://urn.fi/URN:NBN:fi:tty-201712202421>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Cost- and time-effective sewing patterns for embroidered passive UHF RFID tags

Embroidery is an efficient method for the fabrication of textile antennas. We studied the effects of reducing the amount of conductive thread to achieve savings in material costs and the effects of the sewing pattern on the wireless performance of embroidered passive UHF RFID tags on two different fabric substrates. The antennas were sewed on cotton and polyamide fabrics, the ICs were attached to the embroidered antennas with a conductive adhesive, and the wireless performance of the ready-made textile RFID tags was evaluated through measurements. The fabric parameters were found to have a major effect on the tag performance. Based on our results, significant amounts of time and conductive yarn can be saved in the embroidery of RFID tag antennas by only partially sewing the tag antenna.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: BioMediTech, Faculty of Biomedical Sciences and Engineering, Research group: Wireless Identification and Sensing Systems Research Group

Contributors: Brechet, N., Ginestet, G., Moradi, E., Ukkonen, L., Torres, J., Björninen, T., Virkki, J.

Pages: 30-33

Publication date: 1 Mar 2017

#### Host publication information

Title of host publication: Proceedings of IEEE 2017 International Workshop on Antenna Technology

Publisher: IEEE

ISBN (Electronic): 978-1-5090-5176-2

Electronic versions:

PID4547891

DOIs:

10.1109/IWAT.2017.7915289

URLs:

<http://urn.fi/URN:NBN:fi:tty-201712202422>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### 1180 nm GaInNAs quantum well based high power DBR laser diodes

We report state-of-the-art results for 1180nm (narrow linewidth) laser diodes based on GaInNAs quantum wells and show results for ridge waveguide DBR laser diode including its reliability tests. Manuscript demonstrates 500 mW output power in continuous-wave operation at room temperature, wide single mode tuning region and narrow linewidth operation. Devices reached narrow linewidth operation (>250 kHz) across their operation band.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Optoelectronics Research Centre, Tampere University of Technology

Contributors: Viheriälä, J., Aho, A., Virtanen, H., Koskinen, M., Dumitrescu, M., Guina, M.

Number of pages: 6

Publication date: 24 Feb 2017

#### Host publication information

Title of host publication: High-Power Diode Laser Technology XV

Publisher: SPIE

Editor: Zediker, M. S.

Article number: 100860K

#### Publication series

Name: Proceedings of SPIE

Publisher: SPIE

Volume: 10086

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Physics and Astronomy (miscellaneous)

Keywords: DBR laser, dbr, 1180nm, 1178nm, 1154nm, SHG

DOIs:

10.1117/12.2251317

#### Bibliographical note

INT=fot,"Koskinen, Mervi"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Multi-wavelength mid-IR light source for gas sensing

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Research group: Semiconductor Technology and Applications, VTT Technical Research Ctr. of Finland Ltd., Institute of Electronic Materials Technology, Vaisala Oyj, GasSecure AS, VIGO System S.A.

Contributors: Karioja, P., Alajoki, T., Cherchi, M., Ollila, J., Harjanne, M., Heinilehto, N., Suomalainen, S., Viheriälä, J., Zia, N., Guina, M., Buczyński, R., Kasztelaniec, R., Kujawa, I., Salo, T., Virtanen, S., Kluczynski, P., Sagberg, H., Ratajczyk, M., Kalinowski, P.

Publication date: 20 Feb 2017

#### Host publication information

Title of host publication: Proc. SPIE 10110 : Photonic Instrumentation Engineering IV

Volume: 10110

Publisher: SPIE

Article number: 101100P

ISBN (Print): 9781510606616

ISBN (Electronic): 9781510606623

#### Publication series

Name: Proceedings of SPIE

Volume: 10110

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

DOIs:

10.1117/12.2249126

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Intracavity double diode structures with GaInP barrier layers for thermophotonic cooling

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Research group: Semiconductor Technology and Applications, Research group: Ultrafast and intense lasers

Contributors: Tiira, J., Radevici, I., Haggren, T., Hakkarainen, T., Kivisaari, P., Lytikäinen, J., Aho, A., Tukiainen, A., Guina, M., Oksanen, J.

Publication date: 17 Feb 2017

#### Host publication information

Title of host publication: Proc. SPIE 10121 : Optical and Electronic Cooling of Solids II

Volume: 10121

Publisher: SPIE

Article number: 1012109

ISBN (Electronic): 9781510606838

#### Publication series

Name: Proceedings of SPIE

Volume: 10121

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

DOIs:

10.1117/12.2250843

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Color-distribution similarity by information theoretic divergence for color images

The divergence similarity between two color images is presented based on the Jensen-Shannon divergence to measure the color-distribution similarity. Subjective assessment experiments were developed to obtain mean opinion scores (MOS) of test images. It was found that the divergence similarity and MOS values showed statistically significant correlations.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Research group: Vision, University of Niigata, KLab, Japan, K-JIST, Dongguk University, Seoul

Contributors: Murayama, M., Oguro, D., Kikuchi, H., Huttunen, H., Ho, Y. S., Shin, J.

Publication date: 17 Jan 2017

#### Host publication information

Title of host publication: 2016 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference, APSIPA 2016

Publisher: IEEE

ISBN (Electronic): 9789881476821

ASJC Scopus subject areas: Artificial Intelligence, Computer Science Applications, Information Systems, Signal Processing

DOIs:

10.1109/APSIPA.2016.7820681

#### **Bibliographical note**

JUF0ID=72850

Source: Scopus

Source ID: 85013813769

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### **Novel equipment to simulate hot air heat sealability of packaging materials**

##### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science, Research group: Paper Converting and Packaging

Contributors: Lahti, J., Kuusipalo, J., Auvinen, S.

Number of pages: 12

Pages: 237-248

Publication date: 1 Jan 2017

##### **Host publication information**

Title of host publication: 16th TAPPI European PLACE Conference 2017

Publisher: TAPPI Press

ISBN (Electronic): 9781510850880

ASJC Scopus subject areas: Media Technology, Chemical Engineering(all), Chemistry(all), Mechanical Engineering, Materials Science(all)

Source: Scopus

Source ID: 85044468996

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### **Effect of air gap on the adhesion of PET layer on cardboard substrate in extrusion coating**

##### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science

Contributors: Suokas, E.

Number of pages: 16

Pages: 529-544

Publication date: 1 Jan 2017

##### **Host publication information**

Title of host publication: 16th TAPPI European PLACE Conference 2017

Publisher: TAPPI Press

ISBN (Electronic): 9781510850880

ASJC Scopus subject areas: Media Technology, Chemical Engineering(all), Chemistry(all), Mechanical Engineering, Materials Science(all)

Source: Scopus

Source ID: 85044480842

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### **Novel bio-based materials for active and intelligent packaging**

##### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science

Contributors: Lahti, J., Kamppuri, T., Kuusipalo, J.

Number of pages: 1

Publication date: 1 Jan 2017

##### **Host publication information**

Title of host publication: 16th TAPPI European PLACE Conference 2017

Publisher: TAPPI Press

ISBN (Electronic): 9781510850880

ASJC Scopus subject areas: Media Technology, Chemical Engineering(all), Chemistry(all), Mechanical Engineering, Materials Science(all)

Source: Scopus

Source ID: 85044445672

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Cavitation erosion, slurry erosion and solid particle erosion performance of metal matrix composite (MMC) coatings sprayed with modern high velocity thermal spray processes**

Thermally sprayed metal-matrix composite (MMC) coatings are widely used to protect components and surfaces against wear in various applications. Hard and wear resistant coatings increase the component lifetime and allow the refurbishment of the worn components. This produces significant savings and promotes ecological manufacturing. The current state-of-the-art coatings are produced with high velocity oxygen-fuel (HVOF) spray processes, while modern high velocity air-fuel (HVOF) spray process has become increasingly available in production and research. The current study focuses on the performance of tungsten carbide (WC-10Co4Cr) and chromium carbide ( $\text{Cr}_3\text{C}_2$ -25NiCr) based MMC coatings sprayed with gaseous and liquid fuelled HVOF processes and a modern HVOF spray process. Two powder feedstock types, i.e. dense particles with fine carbides and porous particles with coarse carbides, were selected for both compositions. The results show significant improvements especially for WC-10Co4Cr coatings sprayed with HVOF when compared to HVOF sprayed coatings. In addition,  $\text{Cr}_3\text{C}_2$ -25NiCr coatings sprayed from the dense powder resulted in improved wear resistance compared to conventional feedstock powder.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science, Research group: Surface Engineering, Research group: Materials Characterization, VZÚ Plzeň, University of West Bohemia

Contributors: Matikainen, V., Rubio, S., Ojala, N., Koivuluoto, H., Schubert, J., Houdková, S., Vuoristo, P.

Number of pages: 3

Pages: 1161-1163

Publication date: 1 Jan 2017

#### **Host publication information**

Title of host publication: Materials Science and Technology Conference and Exhibition 2017, MS and T 2017 : October 8-12, 2017, Pittsburgh, Pennsylvania USA

Volume: 2

Publisher: Association for Iron and Steel Technology, AISTECH

ISBN (Electronic): 9781510850583

ASJC Scopus subject areas: Mechanics of Materials, Materials Science (miscellaneous), Energy Engineering and Power Technology

Keywords: Cavitation erosion, Coating, Metal matrix composite, Slurry erosion, Thermal spray

URLs:

<http://toc.proceedings.com/36807webtoc.pdf>

Source: Scopus

Source ID: 85047650405

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Tampere University of Technology, laboratory of materials science, paper converting and packaging technology Tampere, Finland**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science, Research group: Paper Converting and Packaging

Contributors: Kuusipalo, J., Lahti, J.

Number of pages: 1

Publication date: 1 Jan 2017

#### **Host publication information**

Title of host publication: 16th TAPPI European PLACE Conference 2017 : Basel; Switzerland; 22 May 2017 through 24 May 2017

Volume: May-2017

Publisher: TAPPI Press

ISBN (Electronic): 9781510850880

ASJC Scopus subject areas: Media Technology, Chemical Engineering(all), Chemistry(all), Mechanical Engineering, Materials Science(all)



URLs:

<http://www.scopus.com/inward/record.url?scp=85044476202&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 85044476202

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Multilag Frequency Estimation for High-Order BOC Signals in the Acquisition Stage**

In the context of global navigation satellite systems, this paper addresses the problem of refining the Doppler frequency estimation provided in the acquisition stage for high-order binary offset carrier (BOC) signals in post-correlation. The refinement of Doppler frequency must be done because the estimation obtained from the acquisition stage is not usually accurate enough to track the signal in the tracking stage. In this work, we only use the cross-ambiguity function (CAF) created in the acquisition stage to perform the refinement. A least squares estimator has been already applied to mitigate this problem. We propose a new technique, referred to as multilag least squares estimator, which improves the performance of the least squares estimator by exploiting the autocorrelation shape of high-order BOC signals. Moreover, the Cramer-Rao bound and the expected Cramer-Rao bound are derived as benchmark to compare the performance of the least squares and multilag least squares estimators.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Universidad Autónoma de Barcelona, Universitat Autònoma de Barcelona, Spain

Contributors: Gomez Casco, D., Lohan, E., Lopez-Salcedo, J. A., Seco-Granados, G.

Publication date: 2017

#### **Host publication information**

Title of host publication: 2016 8th ESA Workshop on Satellite Navigation Technologies and European Workshop on GNSS Signals and Signal Processing (NAVITEC)

Publisher: IEEE

ISBN (Electronic): 978-1-5090-3885-5

Electronic versions:

Navitec2016

DOIs:

[10.1109/NAVITEC.2016.7849325](https://doi.org/10.1109/NAVITEC.2016.7849325)

URLs:

<http://urn.fi/URN:NBN:fi:tty-201802141231>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Dynamic laser speckle metrology with binarization of speckle patterns**

Dynamic laser speckle analysis is non-destructive detection of physical or biological activity through statistical processing of speckle patterns on the surface of diffusely reflecting objects. This method is sensitive to microscopic changes of the surface over time and needs simple optical means. Advances in computers and 2D optical sensors forced development of pointwise algorithms. They rely on acquisition of a temporal sequence of correlated speckle images and generate activity data as a 2D spatial contour map of the estimate of a given statistical parameter. The most widely used pointwise estimates are the intensity-based estimates which compose each map entry from a time sequence of intensity values taken at one and the same pixel in the acquired speckle images. Accuracy of the pointwise approach is strongly affected by the signal-dependent nature of the speckle data when the spread of intensity fluctuations depends on the intensity itself. The latter leads to erroneous activity determination at non-uniform distribution of intensity in the laser beam for the non-normalized estimates. Normalization of the estimates, introduces errors. We propose to apply binarization to the acquired speckle images by comparing the intensity values in the temporal sequence for a given spatial point to the mean intensity value estimated for this point and to evaluate a polar correlation function. Efficiency of this new processing algorithm is checked both by simulation and experiment.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Research group: 3D MEDIA, Bulgarian Academy of Sciences

Contributors: Stoykova, E., Nazarova, D., Berberova, N., Gotchev, A., Ivanov, B., Mateev, G.

Publication date: 2017

#### **Host publication information**

Title of host publication: 19th International Conference and School on Quantum Electronics: Laser Physics and Applications

Publisher: SPIE

Article number: 102260R  
ISBN (Electronic): 9781510609532

#### Publication series

Name: Proceedings of SPIE

Volume: 10226

ISSN (Print): 0277-786X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: Binary patterns, Dynamic speckle, Intensity-based algorithms, Optical metrology, Pointwise processing

DOIs:

10.1117/12.2262330

#### Bibliographical note

JUFID=71479

Source: Scopus

Source ID: 85017345812

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Educating Computer Science Educators Online - A Racket MOOC for Elementary Math Teachers of Finland

Many countries all over the world are in the process of introducing programming into their K-12 curricula. New Finnish Curriculum includes programming mentioned especially in accordance with mathematics and crafts. Consequently, Finland needs to train teachers to teach programming at elementary school level. In this paper, we describe how elementary math teachers were educated online to teach programming using the Racket programming language. The aim of the course was to increase both content knowledge (CK) and technological pedagogical content knowledge (TPACK). By analyzing the course feedback, questionnaires and exercise data, we present the teachers' views on the course and effects on their professional development (TPD). Finally, we describe development ideas for future online courses.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, Research area: Software engineering

Contributors: Partanen, T., Niemelä, P., Mannila, L., Poranen, T.

Pages: 47-58

Publication date: 2017

#### Host publication information

Title of host publication: Proceedings of the 9th International Conference on Computer Supported Education

Publisher: SCITEPRESS - Science and Technology Publications

ISBN (Electronic): 978-989-758-239-4

DOIs:

10.5220/0006257800470058

Source: Bibtex

Source ID: urn:d6146dd9d542d5c0a85f938eb99499e9

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Picosecond MOPA with ytterbium doped tapered double clad fiber

The powerful picosecond master oscillator - power amplifier (MOPA) with double clad ytterbium doped tapered fiber as a buster amplifier has been demonstrated in the presented paper. The developed MOPA has 60ps pulses with 0.3mJ pulse energy and 5MW peak power.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Ultrafast and intense lasers, Photonics, Research group: Nanophotonics, Ampliconix Ltd, Institute of Radio Engineering and Electronics of the Russian Academy of Sciences

Contributors: Filippov, V., Vorotynskii, A., Noronen, T., Gumenyuk, R., Chamorovskii, Y., Golant, K.

Number of pages: 6

Publication date: 2017

#### Host publication information

Title of host publication: Fiber Lasers XIV : Technology and Systems

Volume: 10083

Publisher: SPIE

Article number: 100831H

ISBN (Electronic): 9781510606074

### Publication series

Name: Proceedings of SPIE

Publisher: SPIE

No.: 10083

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: Fiber laser, Picosecond laser, Ultrafast laser

DOIs:

10.1117/12.2252006

Source: Scopus

Source ID: 85019465842

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Web-user-interface system utilizing rhmei and open data for a water quality analyzer

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Software Engineering and Intelligent Systems, Pervasive Computing, Keio University, Japan, Global Environmental System Leaders Program, Keio University, Japan

Contributors: Sillberg, P., Veksommai, C., Soini, J., Jaakkola, H.

Number of pages: 8

Pages: 444-451

Publication date: 2017

#### Host publication information

Title of host publication: The Proceedings of the 27th International Conference on Information Modelling and Knowledge Bases, EJC 2017 : June 5-9, 2017, Krabi, Thailand

Publisher: Sirindhorn International Institute of Technology, Thammasat University, Thailand

Editors: Sornlertlamvanich, V., Chawakitchareon, P., Hansuebsai, A., Koopipat, C., Kiyoki, Y., Kangassalo, H., Thalheim, B., Yoshida, N.

ISBN (Electronic): 978-616-407-165-0

Electronic versions:

water

URLs:

<http://urn.fi/URN:NBN:fi:tyy-201712042302>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### VisualLabel: An Integrated Multimedia Content Management and Access Framework

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Pervasive Computing, Research group: Software Engineering and Intelligent Systems, Arcada University of Applied Sciences, Aalto University, department of Computer Science, Lynx Technology Finland Oy, Aalto University

Contributors: Ahmad, I., Rantanen, P., Sillberg, P., Laaksonen, J., Liu, S., Forss, T., Malik, A., Nieminen, M., Shetty, R., Ishikawa, S., Kallio, J., Saarinen, J. P., Gabbouj, M., Soini, J.

Number of pages: 22

Pages: 332-353

Publication date: 2017

#### Host publication information

Title of host publication: The Proceedings of the 27th International Conference on Information Modelling and Knowledge Bases, EJC 2017 : June 5-9, 2017, Krabi, Thailand

ISBN (Electronic): 978-616-407-165-0

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Gamification at School**

Traditional teacher-oriented teaching methods in a lecture style are no longer viewed as effective enough for learning and are therefore criticized. It is generally agreed that the modern education should engage students, stimulate interests and maintain a positive attitude. In other words, there should be a way to further learning for example by combining it with playing. This is why many educators and researchers devise new strategies, tools, methods and techniques of novel and engaging activities in order to gamify education. Gamification is often defined as the use of game mechanics and game design techniques in non-game contexts. The present study focuses on investigating possibilities of gamification at school and in a classroom setting. In this study, to complement current research knowledge in the field of classroom and education gamification, students and teachers (n = 120) provided their point of view how to utilize gamification for learning and teaching purposes. As a result, several perfectible and creative concepts were figured out. Implications of the findings for future research are discussed and research based recommendations are presented.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: TUT Game Lab, Pervasive Computing

Contributors: Perttula, A., Tuomi, P.

Pages: 9334-9340

Publication date: 2017

#### **Host publication information**

Title of host publication: EDULEARN17 : The 9th International Conference on Education and New Learning Technologies

ISBN (Electronic): 978-84-697-3777-4

DOIs:

10.21125/edulearn.2017.0756

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Eye tracking studies focusing on mathematics: a literature review**

It is generally agreed that mathematics is a critical skill for all. To support learning of mathematics, eye tracking can reveal why do students struggle with it. The method can be utilized to investigate different phases in the processing of mathematical representations. For example, the number of fixations and gaze points can inform about the amount of processing devoted to specific mathematical components. The scan path might be particularly informative with regard to viewing and comparison strategy. Altogether, based on the literature review eye tracking studies focusing on mathematics include topics such as arithmetic, word problems, dyscalculia, geometry, algebraic expressions and the role of representations in learning. However, despite of conducted research and promising results, recent eye tracking technology could be used at greater degree in studying ways to improve mathematical skills and detect misconceptions. This paper reviews published eye tracking studies focusing on mathematics, identifies directions for further research, and makes research based recommendations for ways to improve learning of mathematics.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: TUT Game Lab, Pervasive Computing

Contributors: Perttula, A.

Publication date: 2017

#### **Host publication information**

Title of host publication: INTED2017. The 11th annual International Technology, Education and Development Conference : Valencia, 6th - 8th of March, 2017.

Publisher: IATED Academy

Article number: 2166-2173

ISBN (Electronic): 978-84-617-8491-2

DOIs:

10.21125/inted.2017.0639

#### **Bibliographical note**

jufoid=85044

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Real-Time Impedance-Based Stability Assessment of Grid Converter Interactions**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Automation and Hydraulic Engineering, Research area: Dynamic Systems, Research area: Measurement Technology and Process Control, Research area: Measurement Technology and Process Control, Electrical Energy

Engineering, Aalborg University

Contributors: Messo, T., Luhtala, R., Roinila, T., Yang, D., Wang, X., Blaabjerg, F.

Number of pages: 8

Publication date: 2017

#### Host publication information

Title of host publication: IEEE Workshop on Control and Modeling for Power Electronics

ISBN (Electronic): 978-1-5090-5326-1

Electronic versions:

COMPEL\_2017\_final\_version

DOIs:

10.1109/COMPEL.2017.8013384

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Samsung and Volkswagen crisis communication in Facebook and Twitter: A comparative study

Since September 2015 at least two major crises have emerged where major industrial companies producing consumer products have been involved. In September 2015 diesel cars manufactured by Volkswagen turned out to be equipped with cheating software that caused NO<sub>2</sub> and other emission values to be reduced to acceptable levels while tested from the real, unacceptable values in normal use. In August 2016 reports began to appear that the battery of a new smart phone produced by Samsung, Galaxy Note7, could begin to burn, or even explode, while the device was on. In Nov. 2016 also 34 washing machine models were reported to have caused damages due to disintegration. In all cases, the companies have experienced substantial financial losses, their shares have lost value, and their reputation has suffered among consumers and other stakeholders. In this paper, we study the commonalities and differences in the crisis management strategies of the companies, mostly concentrating on the crisis communication aspects. We draw on Situational Crisis Communication Theory (SCCT). The communication behaviour of the companies and various stakeholders during crisis is performed by investigating the official web sites of the companies and communication in Twitter and Facebook on their own accounts. We also collected streaming data from Twitter where Samsung and the troubled smart phone or washing machines were mentioned. For VW we also collected streaming data where the emission scandal or its ramifications were mentioned and performed several analyses, including sentiment analysis.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Jyväskylän yliopisto, Laboratory of Industrial and Information Management

Contributors: Zhang, B., Veijalainen, J., Kotkov, D.

Number of pages: 12

Pages: 312-323

Publication date: 2017

#### Host publication information

Title of host publication: WEBIST 2017 - Proceedings of the 13th International Conference on Web Information Systems and Technologies

Publisher: SCITEPRESS

ISBN (Electronic): 9789897582462

ASJC Scopus subject areas: Computer Networks and Communications, Information Systems

Keywords: Crisis communication strategies, Facebook, Samsung Galaxy Note 7 crisis, Samsung washing machine crisis, SCCT, Sentiment analysis, Twitter, Volkswagen emission crisis

DOIs:

10.5220/0006301403120323

Source: Scopus

Source ID: 85024488684

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### The Web as a software platform: Ten years later

In the past ten years, the Web has become a dominant deployment environment for new software systems and applications. In view of its current popularity, it is easy to forget that only 10-15 years ago hardly any developer would write serious software applications for the Web. Today, the use of the web browser as a software platform is commonplace, and JavaScript has become one of the most popular programming languages in the world. In this paper we revisit some predictions that were made over ten years ago when the Lively Kernel project was started back in 2006. Ten years later, most of the elements of the original vision have been fulfilled, although not entirely in the fashion we originally envisioned. We look back at the Lively Kernel vision, reflecting our original goals to the state of the art in web programming today.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Pervasive Computing, Nokia, University of Helsinki  
Contributors: Taivalsaari, A., Mikkonen, T.  
Number of pages: 10  
Pages: 41-50  
Publication date: 2017

#### Host publication information

Title of host publication: WEBIST 2017 - Proceedings of the 13th International Conference on Web Information Systems and Technologies  
Publisher: SCITEPRESS  
ISBN (Electronic): 9789897582462  
ASJC Scopus subject areas: Computer Networks and Communications, Information Systems  
Keywords: HTML5, JavaScript, Live object systems, Lively kernel, Web applications, Web programming  
DOIs:  
10.5220/0006234800410050  
Source: Scopus  
Source ID: 85024473230  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Inter-organizational knowledge sharing barriers within an sme network: a case study

SMEs often seek to supplement their scarce resources and limited knowledge base by networking. This calls for efficient knowledge sharing within the network, which is, however, often complicated by the existence of knowledge barriers. This paper seeks answers to the question "what are the knowledge barriers that hinder inter-organizational knowledge sharing in SME networks?" The issue is empirically examined through a case study that was carried out by the participative observation research method. The case is a network consisting of SMEs whose joint objective was to increase the companies' capabilities in digitalization by sharing knowledge within the network. The paper concludes that companies' ability in sharing knowledge within a network vary greatly due to, e.g. varying needs concerning the level of knowledge pursued from the network, imbalanced knowledge base, and cognitive proximity/shared interests of the network companies. Firstly, some companies' goals may be acquiring highly specialized knowledge from the network, while others are potentially interested in harnessing rather general level knowledge. Secondly, those companies that have a broader/deeper knowledge base than others may protect their knowledge more carefully. Thirdly, the lack of understanding the value of knowledge may also lead to unwillingness of sharing knowledge with others, or, vice versa, not being able to utilize the valuable knowledge shared by others. Based on the empirical findings we can conclude that companies that share the same information needs and do not settle for merely sharing knowledge with each other go beyond the typical knowledge sharing and proceed to develop the issues of mutual interest via deeper dialogue.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Industrial and Information Management, Research group: Knowledge and Learning Research Center, Häme University of Applied Sciences  
Contributors: Meriläinen, K., Vuori, V., Helander, N.  
Number of pages: 8  
Pages: 690-697  
Publication date: 2017

#### Host publication information

Title of host publication: Proceedings of the 18th European Conference on Knowledge Management : Barcelona, Spain, 7-8 September 2017  
Place of publication: Reading, UK  
Publisher: Academic Conferences and Publishing International Limited  
ISBN (Print): 978-1-911218-48-7  
ISBN (Electronic): 978-1-911218-49-4  
URLs:  
<http://www.academic-conferences.org/conferences/eckm/future-past-conferences/>  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Perspectives on tools and applications supporting co-creation in knowledge work

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Knowledge and Learning Research Center, University of Tampere  
Contributors: Okkonen, J., Vuori, V.  
Number of pages: 8  
Pages: 369-376  
Publication date: 2017

#### Host publication information

Title of host publication: Proceedings of the 12th International Forum on Knowledge Asset Dynamics 2017 : 7-9 Jun. 2017, St. Petersburg, Russia  
ISBN (Electronic): 978-88-96687-10-9

#### Publication series

Name: Proceedings IFKAD  
ISSN (Print): 2280-787X  
URLs:

[http://gsom.spbu.ru/en/events/event2017\\_06\\_09/](http://gsom.spbu.ru/en/events/event2017_06_09/)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Experiences from development of security audit criteria

Cyber-attacks have grown in importance to become a matter of national security. A growing number of states and organisations around the world have been developing defensive and offensive capabilities for cyber warfare. Security criteria are important tools for defensive capabilities of critical communications and information systems (CIS). Various criteria have been developed for designing, implementing and auditing CIS. The paper is based on work done from 2008 to 2016 at FICORA, the Finnish Communications Regulatory Authority. FICORA has actively participated in development and usage of three versions of Katakri, the Finnish national security audit criteria. Katakri is a tool for assessing the capability of an organisation to safeguard classified information. While built for governmental security authorities, usefulness for the private sector has been a central design goal of the criteria throughout its development. Experiences were gathered from hundreds of CIS security audits conducted against all versions of Katakri. Feedback has been gathered also from CIS audit target organisations including governmental authorities and the private sector, from other Finnish security authorities, from FICORA's accredited third party Information Security Inspection Bodies, and from public sources. This paper presents key lessons learnt and discusses recommendations for the design and implementation of security criteria. Security criteria have significant direct impacts on CIS design and implementation. Criteria design is always a trade-off between the varying goals of the target users. Katakri has tried to strike a balance between the different needs for security criteria. The paper recommends that criteria design should stem from a small set of strictly defined use cases. Trying to cover the needs of a wide variety of different use cases quickly renders the criteria useless as an assessment tool. In order to provide sufficient information assurance, security criteria should describe requirements on a reasonably concrete level, but also provide support for the security and risk management processes of the target users.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Pervasive Computing, Univ of Oulu  
Contributors: Kelo, T., Eronen, J.  
Number of pages: 8  
Pages: 208-215  
Publication date: 2017

#### Host publication information

Title of host publication: Proceedings of the 16th European Conference on Cyber Warfare and Security, ECCWS 2017  
Publisher: TAPPI Press; Curran Associates, Inc  
ISBN (Electronic): 9781911218432  
ASJC Scopus subject areas: Information Systems, Information Systems and Management, Safety, Risk, Reliability and Quality  
Keywords: Auditing, Criteria, Cyber security, Information assurance, Katakri

#### Bibliographical note

JUF0ID=71915  
Source: Scopus  
Source ID: 85028004488  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### The role of performance measurement in supplier-buyer value-creation

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Center for Research on Operations Projects and Services

Contributors: Jääskeläinen, A., Thitz, O., Heikkilä, J.

Publication date: 2017

### Host publication information

Title of host publication: Proceedings of 9th Conference on Performance Measurement and Management Control : 13-15 September 2017, Nice, France

Publisher: EIASM

### Publication series

Name: Conference on Performance Measurement and Management Control

Publisher: EIASM

ISSN (Electronic): 2295-1660

URLs:

[http://www.eiasm.org/frontoffice/event\\_announcement.asp?event\\_id=1187#4844](http://www.eiasm.org/frontoffice/event_announcement.asp?event_id=1187#4844)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Modeling the process of dynamic resource sharing between LTE and NB-IoT services

The Internet of Things (IoT) undergoes fundamental changes, expanding its infrastructure with more advanced and mobile devices. As the IoT develops, the existing cellular communication technologies often do not provide sufficient coverage while modern IoT terminals are often expensive and characterized by a short battery life. To address these issues, in Release 13 (LTE Advanced Pro) published in 2016, 3GPP consortium has proposed the Narrow-Band IoT (NB-IoT) technology as an efficient way to provide a wide range of new capabilities and services in a wireless cellular network. Having specified three operational regimes, 3GPP did not provide guidelines on the way resource sharing has to be done between LTE and NB-IoT traffic. In this paper, the in-band NB-IoT service model is presented, where a certain amount of LTE radio resources are exclusively allocated to LTE and NB-IoT users while the rest are shared between them. We analyze the proposed system for performance metrics of interest including NB-IoT and LTE session drop probabilities and resource utilization.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Electronics and Communications Engineering, Research group: Emerging Technologies for Nano-Bio-Info-Cogno, Peoples' Friendship University of Russia, Russian Academy of Sciences, Department of Applied Probability and Informatics, Institute of Informatics Problems

Contributors: Begishev, V., Samuylov, A., Moltchanov, D., Samouylov, K.

Number of pages: 12

Pages: 1-12

Publication date: 2017

### Host publication information

Title of host publication: Distributed Computer and Communication Networks - 20th International Conference, DCCN 2017, Proceedings

Publisher: Springer Verlag

ISBN (Print): 9783319668352

### Publication series

Name: Communications in Computer and Information Science

Volume: 700

ISSN (Print): 1865-0929

ASJC Scopus subject areas: Computer Science(all)

Keywords: Analytical model, Internet of things, NB-IoT (narrow band IoT), Resource sharing, Session drop probability  
DOIs:

10.1007/978-3-319-66836-9\_1

Source: Scopus

Source ID: 85029718143

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Utilizing knowledge networks in virtual or augmented reality solution creation

Contemporary digital transformation brings new opportunities for companies, lately especially in the form of virtual and augmented reality solutions (VR/AR). While the technologies are developing fast, knowledge about them and their possibilities is difficult to locate and reach. Cross-organizational knowledge networks that share knowledge about technology and its applications are needed. This paper analyzes cross-organizational knowledge sharing networks that



operate behind the scenes of virtual and augmented reality. To understand the knowledge networking processes, this paper presents a case study of a regional VR/AR community. The aim of the paper is to understand how knowledge sharing networks naturally operate in the VR/AR context and what kind of processes and tools organizations harness. The paper presents a description on how the interviewed organizations and individuals utilize their knowledge network in VR/AR knowledge acquisition and creation. The distinct characteristics of the VR/AR field are discussed in light of existing literature on knowledge sharing and knowledge networks. In the findings, the need for a more systematic way of utilizing the network is identified. Knowledge networks provide the best value for their members when the network is actively harnessed, and there are network actors who focus on systematically spreading knowledge across the network. While the case study shows that the network members feel that they gain knowledge from the network, the use of the network varies between organizations and individuals. The network shows signs of movement toward more systematic knowledge sharing, and the knowledge network literature suggests that this development will improve the benefits of network participation for all actors in the network. Further studies on a larger scale in similar types of networks are suggested to allow better understanding of knowledge sharing in knowledge networks, and the challenges and benefits that are connected to it. VR/AR development as a rapidly evolving field lends itself to be an interesting context for studying knowledge networks.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Knowledge and Learning Research Center, Pervasive Computing, Research area: User experience, Tampere University of Technology

Contributors: Vanhalakka, J., Ilvonen, I., Väättäjä, H.

Number of pages: 7

Pages: 1008-1014

Publication date: 2017

#### **Host publication information**

Title of host publication: Proceedings of the 18th European Conference on knowledge Management ECKM 2017 : 7-8 September 2017, Barcelona, Spain

Publisher: Academic Conferences and Publishing International

Editors: Marimon, F., Mas-Machuca, M., Berbegal-Mirabent, J., Bastida, R.

ISBN (Print): 978-1-911218-48-7

ISBN (Electronic): 978-1-911218-49-4

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### **Emotion-Gauge: Analyzing affective experiences in B2B customer journeys**

##### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Knowledge and Learning Research Center, Tampere University of Applied Science

Contributors: Andersson, T., Boedeker, M., Vuori, V.

Number of pages: 6

Pages: 31-36

Publication date: 2017

##### **Host publication information**

Title of host publication: Strategic Innovative Marketing : 5th IC-SIM, Athens, Greece, September 23-26, 2016

Publisher: Springer

Editors: Kavoura, A., Sakas, D., Tomaras, P.

ISBN (Print): 978-3-319-56287-2

ISBN (Electronic): 978-3-319-56288-9

##### **Publication series**

Name: Springer Proceedings in Business and Economics

ISSN (Print): 2198-7246

URLs:

<http://www.springer.com/us/book/9783319562872>

<https://www.aueb.gr/en/content/5th-international-conference-strategic-innovative-marketing>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### **Computational wavelength resolution for in-line lensless holography: Phase-coded diffraction patterns and wavefront group-sparsity**

In-line lensless holography is considered with a random phase modulation at the object plane. The forward wavefront propagation is modelled using the Fourier transform with the angular spectrum transfer function. The multiple intensities

(holograms) recorded by the sensor are random due to the random phase modulation and noisy with Poissonian noise distribution. It is shown by computational experiments that high-accuracy reconstructions can be achieved with resolution going up to the two thirds of the wavelength. With respect to the sensor pixel size it is a super-resolution with a factor of 32. The algorithm designed for optimal superresolution phase/amplitude reconstruction from Poissonian data is based on the general methodology developed for phase retrieval with a pixel-wise resolution in V. Katkovnik, "Phase retrieval from noisy data based on sparse approximation of object phase and amplitude", <http://www.cs.tut.fi/~lasip/DDT/index3.html>.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Department of Photonics and Optical Information Technology, ITMO University

Contributors: Katkovnik, V., Shevkunov, I., Petrov, N. V., Egiazarian, K.

Publication date: 2017

#### **Host publication information**

Title of host publication: Digital Optical Technologies 2017

Publisher: SPIE

Article number: 1033509

ISBN (Electronic): 9781510611153

#### **Publication series**

Name: Proceedings of SPIE

Volume: 10335

ISSN (Print): 0277-786X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: Discrete optical signal processing, Image processing, Noise in imaging systems, Phase retrieval, Superresolution

DOIs:

10.1117/12.2269327

#### **Bibliographical note**

jufoid=71479

Source: Scopus

Source ID: 85030715279

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Personality's effect on peer assessment ability in case method context**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Cost Management Center, Research group:

Business Data Research Group, Research group: Center for Research on Operations Projects and Services

Contributors: Mahlamäki, T., Valkeinen, T., Myllärniemi, J., Hellsten, P., Repo, S.

Number of pages: 5

Pages: 6401-6405

Publication date: 2017

#### **Host publication information**

Title of host publication: EDULEARN17 Proceedings. 9th International Conference on Education and New Learning Technologies : 3-5 July, 2017, Barcelona, Spain

Publisher: IATED

ISBN (Electronic): 978-84-697-3777-4

#### **Publication series**

Name: Edulearn proceedings

ISSN (Print): 2340-1125

ISSN (Electronic): 2340-1117

DOIs:

10.21125/edulearn.2017.2455

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Comprehensive survey of similarity measures for ranked based location fingerprinting algorithm**

Ranked Based Fingerprinting uses only ordering indices instead of actual Wi-Fi RSS values in order to make the algorithm insensitive to devices. A key component of the RBF algorithm is a similarity measure which is used to compare and find

the closest ranked fingerprints. Previous papers study a few similarity measures; here we study 49 similarity measures in a test with a benchmark with publicly available indoor positioning database. For different similarity measures the positioning accuracy varies from 15.80 m to 55.22 m. The top 3 similarity measures are Lorentzian, Hamming and Jaccard. Hamming and Jaccard similarity measures have been studied in other papers while Lorentzian had not been studied with that kind of problems.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Automation and Hydraulic Engineering, Signal Processing, Research group: Positioning

Contributors: Minaev, G., Visa, A., Piche, R.

Number of pages: 4

Publication date: 2017

#### Host publication information

Title of host publication: Indoor Positioning and Indoor Navigation (IPIN), 2017 International Conference on

Publisher: IEEE

ISBN (Electronic): 978-1-5090-6299-7

Electronic versions:

MinaevCamera

DOIs:

10.1109/IPIN.2017.8115922

URLs:

<http://urn.fi/URN:NBN:fi:tty-201711292281>

#### Bibliographical note

JUF0ID=72210

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Automatic Classification of Z-ring Formation Stages at the Single Cell Level in Escherichia Coli by Machine Learning

In *E. coli*, Z-ring formation precedes the assembly of the membrane that partitions a cell into two daughter cells. Initially, as FtsZ proteins are expressed, they preferentially locate at the poles. After, they form a ring at midcell, in between the nucleoids, 'marking' where a constriction will form. Finally, the ring becomes a circle, where the septum separating the daughter cells forms. Being the temporal-spatial organization of FtsZ noisy, differing between cells in timing and location, its study requires observing many cells by time-lapse microscopy. To assist, image and signal processing methods are needed to extract information unbiasedly from many cells. Also, one needs automatic identification of the ring formation stage in individual cells. Here we used three classification methods to identify the stage of ring formation from microscopy images: Decision Tree (DT), Support Vector Machine (SVM), and Regularized Multinomial Logistic regression (RMLR). We find that RMLR performs better (higher 10-fold cross-validated accuracy, ACC). Our study will assist future studies at the single cell level of the spatio-temporal dynamics of cell division in *E. coli*.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Laboratory of Biosystem Dynamics-LBD, Signal Processing, BioMediTech, Universidade Nova de Lisboa, Aalto Univ, Aalto University, Dept Signal Proc & Acoust

Contributors: Zare, M., Neeli-Venkata, R., Martins, L., Peltonen, S., Ruotsalainen, U., Ribeiro, A. S.

Number of pages: 5

Pages: 72-76

Publication date: 2017

#### Host publication information

Title of host publication: Proceedings of the 10th International Joint Conference on Biomedical Engineering Systems and Technologies, Vol 2: Bioimaging

Publisher: SCITEPRESS

Editors: Silveira, M., Fred, A., Gamboa, H., Vaz, M.

ISBN (Electronic): 978-989-758-215-8

Keywords: Z-ring Formation, Stages, Time-lapse Microscopy, Classification Methods, DIVISION SITES, PROTEINS FTSZ, LOCALIZATION, SEGREGATION, DYNAMICS

Source: WOS

Source ID: 000413260200008

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Convolutional Recurrent Neural Networks for Rare Sound Event Detection

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Signal Processing, Research group: Audio research group - ARG

Contributors: Cakir, E., Virtanen, T.

Pages: 27-31

Publication date: 2017

### Host publication information

Title of host publication: Proceedings of the Detection and Classification of Acoustic Scenes and Events 2017 Workshop (DCASE2017)

Publisher: Tampere University of Technology. Laboratory of Signal Processing

ISBN (Electronic): 978-952-15-4042-4

URLs:

<http://urn.fi/URN:ISBN:978-952-15-4042-4>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## From theories to game mechanics: Developing a game for training rational numbers

The paper reports the results from an ongoing project that aims to develop an engaging and effective digital game for training conceptual rational number knowledge. The overall research approach is design science. In the paper we report the results of an iteration in which we studied how students used a Semideus School game prototype and how they experienced the core mechanics of the game. 20 fourth graders and 32 sixth graders played Semideus School game for approximately 2.5 hours. Students were allowed to freely play the game with their iPads. Playing experience was studied with a digital questionnaire that included items about flow experience (Flow Short Scale), perceived playability, and acceptance of game-based math training. Additionally, a researcher observed the playing sessions and discussed with the students about the implementation of the game. Students experienced reasonable high flow experience while playing the game. The results revealed that 4th graders would be more willing to study rational numbers with a game and they also appreciated the playability of the game more than sixth graders. Moreover, sixth graders demanded more complex game mechanics, but 4th graders were happy with the core mechanics. We redesigned the game mechanics based on the findings. The paper describes the new mechanics and the theoretical basis of the new design.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing

Contributors: Kiili, K.

Number of pages: 7

Pages: 328-334

Publication date: 2017

### Host publication information

Title of host publication: Proceedings of the 11th European Conference on Games Based Learning, ECGBL 2017

Publisher: Academic Conferences and Publishing International Limited

ISBN (Electronic): 9781911218562

ASJC Scopus subject areas: Software, Computer Graphics and Computer-Aided Design, Computer Networks and Communications, Artificial Intelligence, Human-Computer Interaction, Control and Systems Engineering, Education

Keywords: Game design, Game mechanic, Game-based learning, Mathematics, Playing experience, Rational numbers

Source: Scopus

Source ID: 85036471818

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## Business intelligence approach – a practical tool for competence based curriculum development

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Industrial and Information Management, Research group: Knowledge and Learning Research Center,

Research group: Business Data Research Group, Research group: Cost Management Center, Research group: Center for Research on Operations Projects and Services

Contributors: Myllärniemi, J., Helander, N., Hellsten, P., Mahlamäki, T., Repo, S.

Number of pages: 17

Pages: 6387-6393

Publication date: 2017

### Host publication information

Title of host publication: EDULEARN17 Proceedings. 9th International Conference on Education and New Learning Technologies : 3-5 July, 2017, Barcelona, Spain

Publisher: IATED

ISBN (Print): 978-84-697-3777-4

DOIs:

10.21125/edulearn.2017.2451

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Photo-acoustic Spectroscopy of Resonant Absorption in III-V Semiconductor Nanowires

We show that photo-acoustic spectroscopy allows determination of the nanowire absorbance properties including resonant peak positions and peak broadening due to collective ensemble properties. Furthermore, we demonstrate chiral optical response in asymmetrically Au-coated nanowires.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Photonics, Research group: ORC

Contributors: Hakkarainen, T., Leahu, G., Petronijevic, E., Belardini, A., Centini, M., Li Voti, R., Koivusalo, E., Rizzo Piton, M., Guina, M., Sibilia, C.

Publication date: 2017

### Host publication information

Title of host publication: CLEO: Applications and Technology 2017 : San Jose, California United States 14–19 May 2017

Publisher: The Optical Society; OSA

Article number: JTh2A.48

ISBN (Electronic): 978-1-943580-27-9

DOIs:

10.1364/CLEO\_AT.2017.JTh2A.48

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### A dynamical quality model to continuously monitor software maintenance

Context: several companies, particularly Small and Medium Sized Enterprises (SMEs), often face software maintenance issues due to the lack of Software Quality Assurance (SQA). SQA is a complex task that requires a lot of effort and expertise, often not available in SMEs. Several SQA models, including maintenance prediction models, have been defined in research papers. However, these models are commonly defined as "one-size-fits-All" and are mainly targeted at the big industry, which can afford software quality experts who undertake the data interpretation tasks. Objective: in this work, we propose an approach to continuously monitor the software operated by end users, automatically collecting issues and recommending possible fixes to developers. The continuous exception monitoring system will also serve as knowledge base to suggest a set of quality practices to avoid (re)introducing bugs into the code. Method: first, we identify a set of SQA practices applicable to SMEs, based on the main constraints of these. Then, we identify a set of prediction techniques, including regressions and machine learning, keeping track of bugs and exceptions raised by the released software. Finally, we provide each company with a tailored SQA model, automatically obtained from companies' bug/issue history. Developers are then provided with the quality models through a set of plug-ins for integrated development environments. These suggest a set of SQA actions that should be undertaken, in order to maintain a certain quality level and allowing to remove the most severe issues with the lowest possible effort. Conclusion: The collected measures will be made available as public dataset, so that researchers can also benefit of the project's results. This work is developed in collaboration with local SMEs and existing Open Source projects and communities.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Free University of Bolzano-Bozen, Università degli Studi Dell'Insubria, Former organisation of the author

Contributors: Lenarduzzi, V., Stan, A. C., Taibi, D., Tosi, D., Venters, G.

Number of pages: 11

Pages: 168-178

Publication date: 2017

### Host publication information

Title of host publication: Proceedings of the 11th European Conference on Information Systems Management, ECISM 2017

Publisher: Academic Conferences and Publishing International Limited

ISBN (Electronic): 9781911218524

ASJC Scopus subject areas: Computer Science Applications, Information Systems, Management Information Systems

Keywords: Dynamic Software Measurement, Software Maintenance, Software Quality

URLs:

<http://www.scopus.com/inward/record.url?scp=85029853227&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 85029853227

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Experimenting traditional and modern reliability models in a 3-years european software project**

Reliability is a very important non-functional aspect for software systems and artefacts. In literature, several definitions of software reliability exist and several methods and approaches exist to measure reliability of a software project. However, in the literature no works focus on the applicability of these methods in all the development phases of real software projects. In this paper, we describe the methodology we adopted during the S-CASE FP7 European Project to predict reliability for both the S-CASE platform as well as for the software artefacts automatically generated by using the S-CASE platform. Two approaches have been adopted to compute reliability: The first one is the Rome Lab Model, a well adopted traditional approach in industry; the second one is an empirical approach defined by the authors in a previous work. An extensive dataset of results has been collected during all the phases of the project. The two approaches can complement each other, to support to prediction of reliability during all the development phases of a software system in order to facilitate the project management from a non-functional point-of-view.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Università degli Studi Dell'Insubria, Former organisation of the author

Contributors: Tosi, D., Lenarduzzi, V., Morasca, S., Taibi, D.

Number of pages: 11

Pages: 304-314

Publication date: 2017

#### **Host publication information**

Title of host publication: Proceedings of the 11th European Conference on Information Systems Management, ECISM 2017

Publisher: Academic Conferences and Publishing International Limited

ISBN (Electronic): 9781911218524

ASJC Scopus subject areas: Computer Science Applications, Information Systems, Management Information Systems

Keywords: Early Reliability, Perceived Reliability, Predictive Models, Reliability by design, Rome Lab Model, Static Analysis

URLs:

<http://www.scopus.com/inward/record.url?scp=85039850001&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 85039850001

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Comparing two methods for Urban Complexity calculation using Shannon-Wiener index**

This study will compare the results of measuring Urban Complexity using Shannon-Wiener index in two different methods. Using a joint dataset retrieved from Foursquare API, we will measure the degree of urban complexity of every street 1. relating every amenity to the closest street segment in a computational way and then applying the calculation to the segments, and 2. applying the calculation to every cell of a grid that will be combined with the street network afterwards. The selected case study is the city of London and the dataset employed will be retrieved from Foursquare. Over 79,000 venues were collected and classified in over 660 categories. In order to proceed to the analysis, these 660 categories will be reduced to 10 based on the classification of activities observed in the public space from the traditional urban discipline. Then the urban complexity index of each Street segment of London will be measured as a simultaneous calculation of the density and diversity of collected and classified economic activities.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Architecture, University of Alicante, SPIN Unit

Contributors: López Baeza, J., Cerrone, D., Männigo, K.

Number of pages: 10

Pages: 369-378

Publication date: 2017

#### **Host publication information**

Title of host publication: Comparing two methods for Urban Complexity calculation using Shannon-Wiener index

Publisher: WIT Press

### Publication series

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ISSN (Electronic): 1746-448X

DOIs:

10.2495/SDP170321

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### The role of base substrate on barrier and convertability properties of Water based barrier coated (WBBC) paper and paperboard

Water based barrier coatings (WBBC) have been studied intensively during the past years in order to replace the traditional barrier materials such as polyethylene (PE), fluorochemicals and waxes. One of the largest challenges for these WBBC's has been a high risk for pinholes originating from the base substrate leading into discontinuity in the dispersion layer and poorer barrier properties. By increasing the coat weight, the amount of pinholes can be reduced but this may lead into economical and quality issues, thus optimization is needed. In this study, the role of base material in dispersion coverage and resulting barrier properties was investigated by characterizing different base materials. The barrier properties analyzed were grease and oil resistance and water and water vapour barrier, also convertability properties were examined. The results showed that base substrate plays a key role when WBBC's are used. If the structure of the base paper is very open or very rough, gaining good barrier properties is difficult and the amount of pinholes increases which affects most significantly grease resistance. With very porous and rough base material best possible barrier properties at certain total coat weight were reached by double coating and by using pigments with high aspect ratio.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Materials Science, Research group: Paper Converting and Packaging, CH-Polymers Oy

Contributors: Miettinen, P., Ahokas, M., Engström, T., Heinonen, J., Auvinen, S.

Number of pages: 13

Pages: 220-232

Publication date: 2017

### Host publication information

Title of host publication: Paper Conference and Trade Show, PaperCon 2017 : Renew, Rethink, Redefine the Future, Minneapolis, Minnesota, USA, 23-26 April 2017

Volume: 1

Publisher: TAPPI Press

ISBN (Electronic): 9781510847286

ASJC Scopus subject areas: Forestry, Plant Science, Industrial and Manufacturing Engineering

URLs:

<http://toc.proceedings.com/36006webtoc.pdf>

Source: Scopus

Source ID: 85041534325

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Assessing business learning by analysing ERP simulation log files

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Information Management and Logistics, Research group: Novi

Contributors: Nisula, K., Pekkola, S.

Publication date: 10 Dec 2016

### Host publication information

Title of host publication: AIS SIGED 2016 Conference on IS education and Research. : Dublin, Ireland, December 10-11, 2016

Place of publication: Dublin

ISBN (Print): 978-0-692-81119-1

URLs:

<http://icis2016.aisnet.org/ais-siged-international-conference-education-research/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Improving reliability of replicated message delivery in cellular machine-type communications**

In this paper, we introduce a novel approach for cellular machine-type communications (MTC) based on random access transmissions. It targets a substantial increase in the probability of message delivery at the first transmission attempt. This may be achieved by sending multiple message replicas across a set of transmission opportunities (in time, code, or frequency), which are shared between all the potential MTC devices. For the considered class of access algorithms, we propose the optimal scheme with centralized control that delivers the maximum success probability. This developed approach together with the conventional baseline method (with a single replica) is analyzed in the meta-stable state, and a performance estimate is obtained. Our numerical results - supported by both analysis and simulations - confirm a significant improvement in terms of the probability of immediate message delivery comparing to the conventional transmission, as well as indicate a potential gap with respect to the derived upper bound.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Emerging Technologies for Nano-Bio-Info-Cogno

Contributors: Galinina, O., Turlikov, A., Andreev, S., Koucheryavy, Y.

Number of pages: 5

Pages: 106-110

Publication date: 5 Dec 2016

#### **Host publication information**

Title of host publication: 2016 8th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT)

Publisher: IEEE

ISBN (Electronic): 978-1-4673-8818-4

Keywords: Analytical models, Numerical models, Reliability, Sociology, Statistics, Throughput, Upper bound

DOIs:

10.1109/ICUMT.2016.7765341

Source: Bibtex

Source ID: urn:67d25416e4b4bf5522a2df614d30bd19

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **D2D communications for mobile devices: Technology overview and prototype implementation**

The mobile devices of today evolve towards offering uninterrupted connectivity while attempting to achieve untethered mobility of their users. Further technological advances in hardware often lead to an increased data consumption. Combining these two factors, we notice that the data rates on the current Internet connections are starting to lag behind. Ultimately, we observe a mismatch between the data transfer rate requirements and the actual throughput availability. In this paper, we utilize direct links between proximate devices to help offload the large amounts of user-originated data from the conventional cellular links. The paper explores the implementation possibilities of this technology on the consumer Android devices, as well as substantiates our application development choices. The proposed approach employs the infrastructure-based connections for coordination, while most data transfers happen over the device-to-device links. This allows the developers to utilize our data offloading platform for other proximate applications.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Emerging Technologies for Nano-Bio-Info-Cogno, Department of Pervasive Computing, Research area: Software engineering

Contributors: Devos, M., Ometov, A., Mäkitalo, N., Aaltonen, T., Andreev, S., Koucheryavy, Y.

Pages: 124-129

Publication date: 5 Dec 2016

#### **Host publication information**

Title of host publication: 8th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT)

Publisher: IEEE

ISBN (Print): 978-1-4673-8819-1

ISBN (Electronic): 978-1-4673-8818-4

Keywords: Device-to-device communication, Data transfer, Internet, Mobile communication, IEEE 802.11 Standard, Mobile handsets, Operating systems

DOIs:

10.1109/ICUMT.2016.7765344



## How to develop a new innovation education tool: case of impact canvas

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Innovation and Technology Research, Innovation Services, Research Services, University of Tampere

Contributors: Aarikka-Stenroos, L., Boedeker, S., Köppä, L., Langwaldt, J.

Publication date: Dec 2016

### Host publication information

Title of host publication: In the Proceedings of ISPIM Innovation Summit. The International Society for Professional Innovation Management (ISPIM). : 4-7 December 2016, Kuala Lumpur, Malaysia.

ISBN (Electronic): 978-952-265-931-6

URLs:

<http://summit.ispim.org/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## Business models in the circular economy: a structured multiple-case analysis

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Innovation and Technology Research

Contributors: Ranta, V., Aarikka-Stenroos, L., Mäkinen, S.

Publication date: Dec 2016

### Host publication information

Title of host publication: Proceedings of ISPIM Innovation Summit, Kuala Lumpur, Malaysia. The International Society for Professional Innovation Management (ISPIM) : 4-7 December 2016

ISBN (Electronic): 978-952-265-931-6

URLs:

<http://summit.ispim.org/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## Multi-Objective Optimization of Fin Array Heat Sinks

A method is presented to determine the temperature field of an electronics cooling heat sink. The method is based on calculation of heat conduction in a solid numerically with the finite volume method and on solving fluid convection from analytical equations. The model is suitable for forced and natural convection heat sinks, and it uses solutions of a parallel plate channel for the friction factor and the convection Nusselt number. The validity of the method is verified by comparing its results to measured data and to CFD calculations. After verification, two practical multi-objective optimization examples are given. The first one, an industrial application, is a forced convection heat sink composed of nine heat generating components at the base plate. Then, natural convection optimization is performed on a reference array with two components. In both cases, mass is minimized, the other criterion being the maximum temperature for forced convection case, and the heat sink outer volume for natural convection case.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mechanical Engineering and Industrial Systems, Research area: Design, Development and LCM, Research area: Applied Mechanics

Contributors: Lampio, K., Karvinen, R.

Number of pages: 4

Publication date: 21 Nov 2016

### Host publication information

Title of host publication: Thermic 2016 : 22nd international workshop Thermal investigations of ICs and Systems

Publisher: IEEE

ISBN (Print): 978-1-5090-5450-3

ISBN (Electronic): 978-1-5090-5451-0

DOIs:

10.1109/THERMINIC.2016.7749070

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Pedestrian Dead Reckoning with Particle Filter for Handheld Smartphone**

Commonly used Global Navigation Satellite Systems (GNSS) are inappropriate as Location Based Services (LBS) in indoor environment. Therefore research teams are developing different systems, which can be used as a suitable alternative. One of options is to use Inertial Navigation System (INS) which consists of inertial sensors and mathematic procedures. This concept has been known for a long time, but with arrival of Microelectro Mechanical System (MEMS) INS found wide use. Smartphones with inertial sensors, such as accelerometers and gyroscopes, allow us to use them as input devices for Pedestrian Dead Reckoning (PDR). In this paper we present PDR by using smartphone sensors. They can be classified as low-cost Inertial Measurement Unit (IMU), and have been compared with more precise and expensive Xsens IMU. Accuracy of inertial sensors has increased in the past few years, but they still cannot alone provide proper accuracy because of many negative effects, such as heading drift due to gyroscope bias. Particle Filter (PF) has been successfully used with map constraints to increase the accuracy of proposed location system. Presented results show that low-cost smartphone IMU combined with PF can be applicable as proper navigation system.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: Computer engineering, Signal Processing Research Community (SPRC), University of Zilina

Contributors: Collin, J., Perttula, A., Parviainen, J., Racko, J., Brida, P.

Number of pages: 7

Publication date: 17 Nov 2016

#### **Host publication information**

Title of host publication: 2016 International Conference on Indoor Positioning and Indoor Navigation (IPIN)

Publisher: IEEE

ISBN (Electronic): 978-1-5090-2425-4

Electronic versions:

IPIN\_Racko\_PostPrint

DOIs:

10.1109/IPIN.2016.7743608

URLs:

<http://urn.fi/URN:NBN:fi:tty-201612224910>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Bioimpedance measurement system for evaluation of the status of wound healing**

Hard-to-heal wounds are usually evaluated visually by a medical professional. Visual inspection as a method is subjective and in order to evaluate the wound the dressings have to be removed. Our group has developed a wound patch, a bioimpedance device and a PC software for mapping the wound area and to evaluate the status of wound healing. This study introduces the patch and the measurement system. We also present the test measurement results obtained using an early version of the wound patch. The results confirmed that the patch can be used for the evaluation of the wound status.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Personal Electronics Group, Research group: Physiological Measurement Systems and Methods Group, BioMediTech

Contributors: Kekonen, A., Bergelin, M., Eriksson, J., Ylänen, H., Kielosto, S., Viik, J.

Number of pages: 4

Pages: 175-178

Publication date: 17 Nov 2016

#### **Host publication information**

Title of host publication: 2016 15th Biennial Baltic Electronics Conference (BEC)

Publisher: IEEE

ISBN (Print): 978-1-5090-1394-4

ISBN (Electronic): 978-1-5090-1393-7

Keywords: Wound healing, Bioimpedance, Mapping, Chronic wound

DOIs:

10.1109/BEC.2016.7743757

## Bibliographical note

JUF0ID=72715

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Project types and industrial collaboration in project-based learning

Project-based learning is important in engineering education as it makes the students test their skills in a real-life setting. We have organised project-based learning for software engineering students since 1991. Already in the early times, the projects were based on collaboration with near-by companies and other customers. This collaboration with external organisations, called customers in this paper, creates strong links between education and surrounding society.

In this paper, we report the experiences from our project courses. Especially we describe 1) how the courses have helped collaboration between students, teachers and companies, 2) the different categories for topics and goals of the projects. Based on the analysis, we outline a new project type, a technology exploration project.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: Software engineering

Contributors: Systä, K., Vuori, M., Järvinen, H., Ahtee, T., Sten, H.

Number of pages: 11

Publication date: 12 Nov 2016

### Host publication information

Title of host publication: Proceedings of SEFI 2016 annual conference

Place of publication: Tampere / Brussels

Publisher: European Society for Engineering Education SEFI

Editors: Järvinen, H., Clark, R.

ISBN (Electronic): 9782873520144

ASJC Scopus subject areas: Computer Science(all)

Keywords: project courses, engineering education, innovation, university-industry collaboration

Electronic versions:

[systa-project-types-and-industrial-collaboration](#)

URLs:

<http://sefibenvwh.cluster023.hosting.ovh.net/wp-content/uploads/2017/09/systa-project-types-and-industrial-collaboration-in-project-based-learning-187.pdf>

<http://urn.fi/URN:NBN:fi:tty-201709201899>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### A Survey of People Movement Analytics Studies in the Context of Smart Cities

With the advent of the newest emergency call mandates in US and Europe, with the advances in cellular-based and WiFi-based localization solutions, and with the developments of cloud computing and web-based social networks, the location information and movement-related data is becoming easier and easier to collect from the user mobile devices and from the user cloud data and it is more and more used in a variety of Location Based Services and for various network planning and management tasks. The last decade has seen significant research efforts dedicated to analyze the user location and movement data, to extract mobility patterns and features and to use the predicted patterns for a more efficient resource allocation and for better location-based services. In the context of what is called today 'the smart city', user mobility and location data are becoming key components of the smart city architecture and applications. The goal of this paper is to give a compact and comprehensive overview of the challenges and solutions related to collecting, storing, analyzing, visualizing, using or distributing people's movement data and to summarize the purposes of such data in the context of the smart cities and the Internet of Things

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Aalto University, Tampere University of Technology, Department of Electronics and Communications Engineering, Laboratory for Future Electronics

Contributors: Lohan, E., Kauppinen, T., Debnath, S. B. C.

Pages: 151-158

Publication date: 10 Nov 2016

### Host publication information

Title of host publication: Proceedings of the FRUCT'19

ISBN (Electronic): 978-952-68397-5-2

DOIs:

10.23919/FRUCT.2016.7892195

URLs:

<http://fruct.org/publications/fruct19/files/Loh.pdf>

### **Bibliographical note**

INT=elt,"Debnath, Sree Bash Chandra"

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Terahertz band communications: Applications, research challenges, and standardization activities**

Terahertz frequency band, 0.1–10THz, is envisioned as one of the possible resources to be utilized for wireless communications in networks beyond 5G. Communications over this band will feature a number of attractive properties, including potentially terabit-per-second link capacities, miniature transceivers and, potentially, high energy efficiency. Meanwhile, a number of specific research challenges have to be addressed to convert the theoretical estimations into commercially attractive solutions. Due to the diversity of the challenges, the research on THz communications at its early stages was mostly performed by independent communities from different areas. Therefore, the existing knowledge in the field is substantially fragmented. In this paper, an attempt to address this issue and provide a clear and easy to follow introduction to the THz communications is performed. A review on the state-of-the-art in THz communications research is given by identifying the target applications and major open research challenges as well as the recent achievements by industry, academia, and the standardization bodies. The potential of the THz communications is presented by illustrating the basic tradeoffs in typical use cases. Based on the given summary, certain prospective research directions in the field are identified.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Emerging Technologies for Nano-Bio-Info-Cogno

Contributors: Petrov, V., Pyattaev, A., Moltchanov, D., Koucheryav, Y.

Number of pages: 8

Pages: 1-8

Publication date: 20 Oct 2016

### **Host publication information**

Title of host publication: 2016 8th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT)

Publisher: IEEE

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ASJC Scopus subject areas: Electrical and Electronic Engineering

Electronic versions:

Terahertz band communications

DOIs:

10.1109/ICUMT.2016.7765354

URLs:

<http://urn.fi/URN:NBN:fi:tyy-201612294926>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Charge relaxation of slowly dissipative polymers**

Charge relaxation times of solid planar polymers were assessed with different charging methods in a controlled environment. Electrically isolated samples had relatively long relaxation periods. The longest measurement sequence was 62 hours. An electrostatic behavior of the samples under test was then characterized in a changing electrostatic field.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering

Contributors: Viheriäkoski, T., Kärjä, E., Hillberg, J., Tamminen, P.

Number of pages: 9

Pages: 1-9

Publication date: 18 Oct 2016

### **Host publication information**

Title of host publication: 2016 38th Electrical Overstress/Electrostatic Discharge Symposium (EOS/ESD)

Publisher: IEEE

ISBN (Electronic): 978-1-5853-7289-8

Keywords: electric charge, electrostatics, polymers, charge relaxation, electrical isolated sample, electrostatic field behavior, slowly dissipative polymer, solid planar polymer, time 62 hour, Charge measurement, Charge transfer, Electric potential, Electrodes, Electrostatics, Ions

DOIs:

10.1109/EOSESD.2016.7592533

Source: Bibtex

Source ID: urn:dd06edd7b8b73b5d55aa28c271275556

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Charged cable-system ESD event**

A charged electronic system failed while it was connected to a USB port. The resulting discharge current waveform had a sub-nanosecond initial peak that bypassed on-board protection devices. In this study the ESD stress waveform is analyzed with simulation and measurement methods.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering

Contributors: Tamminen, P., Viheriäkoski, T.

Publication date: 18 Oct 2016

### **Host publication information**

Title of host publication: 2016 38th Electrical Overstress/Electrostatic Discharge Symposium (EOS/ESD)

Publisher: IEEE

ISBN (Electronic): 978-1-5853-7289-8

Keywords: cable shielding, cables (electric), electromagnetic shielding, electrostatic discharge, peripheral interfaces, ESD stress waveform, USB port, charged cable system ESD event, charged electronic system, discharge current waveform, on-board protection devices, subnanosecond initial peak, Cable TV, Cable shielding, Current measurement, Discharges (electric), Power cables, Universal Serial Bus, Wires

DOIs:

10.1109/EOSESD.2016.7592559

Source: Bibtex

Source ID: urn:5e9eb39001154b3f7501d98bb2d14c27

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **A coordination-based brokerage architecture for multi-cloud resource markets**

With an increasing number of service providers in the cloud market, the competition between these is also increasing. Each provider attempts to attract customers by providing a high quality service with lowest possible cost and at the same time trying to make profit. Often, cloud resources are advertised and brokered in a spot market style, i.e., traded for immediate delivery. This paper proposes an architecture for a brokerage model specifically for multi-cloud resource spot markets that integrates the resource brokerage function across several cloud providers. We use a tuple space architecture to facilitate coordination. This architecture supports specifically multiple cloud providers selling unused resources in the spot market. To support the matching process by finding the best match between customer requirements and providers, offers are matched with regard the lowest possible cost available for the customer in the market at the time of the request. The key role of this architecture is to provide the coordination techniques built on a tuple space, adapted to the cloud spot market.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Dublin City University, Free University of Bolzano-Bozen, School of Computing Edinburgh Napier University Edinburgh

Contributors: Aldawood, S., Fowley, F., Pahl, C., Taibi, D., Liu, X.

Number of pages: 8

Pages: 7-14

Publication date: 14 Oct 2016

### **Host publication information**

Title of host publication: Proceedings - 2016 4th International Conference on Future Internet of Things and Cloud Workshops, W-FiCloud 2016

Publisher: Institute of Electrical and Electronics Engineers Inc.

ISBN (Electronic): 9781509039463

ASJC Scopus subject areas: Computer Networks and Communications, Computer Science Applications, Information Systems

Keywords: Cloud Brokerage Architecture, Cloud Resources Market, Resource Brokerage, Spot Market, Tuple Space  
DOIs:

10.1109/W-FiCloud.2016.19

Source: Scopus

Source ID: 85009829349

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Modeling the utilization of a multi-tenant band in 3GPP LTE system with Licensed Shared Access**

Fueled by the rapid growth of mobile services, the actual demand for efficient sharing of available but underutilized frequency spectrum puts pressure on the responsible players (ITU, ETSI) to rethink the feasible ways of allocating wireless spectrum. Today, the LSA regulatory framework is considered to be an important enabler for optimized spectrum sharing between the incumbent and the LSA licensee (e.g., mobile network operator). At any point of time, the frequency bands can be utilized by only a single party, and the spectrum owner has priority in its usage at all times. In this paper, we introduce a mathematical and a system model for the multi-tenant band within the 3GPP LTE cellular network. As the main output of this work, the obtained numerical results for one multi-tenant band are produced. Said band is assumed to be intolerant to traffic delay and our results include the blocking probability as well as the mean downlink TX power of the eNodeB.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Emerging Technologies for Nano-Bio-Info-Cogno

Contributors: Gudkova, I., Markova, E., Masek, P., Andreev, S., Hosek, J., Yarkina, N., Samouylov, K., Koucheryavy, Y.

Number of pages: 5

Pages: 119-123

Publication date: 1 Oct 2016

#### **Host publication information**

Title of host publication: 2016 8th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT)

Publisher: IEEE

ISBN (Electronic): 978-1-4673-8818-4

Keywords: Bit rate, Markov processes, Mathematical model, Numerical analysis, Probability distribution, Quality of service

DOIs:

10.1109/ICUMT.2016.7765343

Source: Bibtex

Source ID: urn:5604995b3f78fcd357c6ed1ead1d8558

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Mid-Infrared Sources for Ultra-Broadband Cavity Enhanced Spectroscopy**

We developed an all-fiber based supercontinuum source spanning from 900 to 3700 nm. We performed incoherent broadband cavity enhanced absorption spectroscopy using that source and were able to detect multicomponent simultaneously.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Physics, Research area: Optics, Research group: Nonlinear Fiber Optics, Research group: Applied Optics

Contributors: Amiot, C. G., Ryczkowski, P., Aalto, A., Toivonen, J., Genty, G.

Number of pages: 2

Publication date: Oct 2016

#### **Host publication information**

Title of host publication: Frontiers in Optics 2016

Publisher: OSA

Article number: FTh5A.3

ISBN (Electronic): 978-1-943580-19-4

URLs:

<https://www.osapublishing.org/abstract.cfm?URI=FiO-2016-FTh5A.3>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## Modelling and Simulation of Radial Spruce Compression to Optimize Energy Efficiency in Mechanical Pulping

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mechanical Engineering and Industrial Systems, Department of Automation Science and Engineering, Research area: Dynamic Systems, Research area: Measurement Technology and Process Control

Contributors: Moilanen, C., Björkqvist, T., Ovaska, M., Koivisto, J., Miksic, A., Engberg, B., Salminen, L., Saarenrinne, P., Alava, M.

Number of pages: 18

Pages: 53-70

Publication date: 26 Sep 2016

### Host publication information

Title of host publication: 2016 International Mechanical Pulping (IMPC) Conference Proceedings, Monday, September 26 - Wednesday, September 28, Jacksonville, Florida, USA

Place of publication: USA

Publisher: TAPPI

Article number: 1.3

ISBN (Print): 978-1-59510-250-7

ISBN (Electronic): 978-1-59510-250-7

Electronic versions:

Modelling and simulation of radial spruce compression

URLs:

<http://urn.fi/URN:NBN:fi:tty-201708281835>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Students' Use of Learning Tools and Tool Types: Solving Self-Study Assignments on an Online Platform

ince 2002, a test titled Mathematics Basic Skills Test (BST) has been organized annually at Tampere University of Technology. In order to pass the Basic Skills Test, a student should be able to complete a set amount out of the 16 assignments within 45 minutes (in fall of 2015, the passing limit was 6 for engineering students, 8 for science and mathematics students). Students who failed the test were directed to the Remedial Instruction (RI). The Remedial Instruction is a set of 71 high school mathematics problems designed to brush up the skills of engineering students.

TUT students have, since 2006, been divided into different learner profile groups. This paper is the summary of studies on the behaviour of these different learner profile groups in the Remedial Instruction regarding their use of time and learning tools when solving their assignments.

Different types of learners indicate that their self-study habits on an online platform are very different. Students that are surface oriented in their studies use a lot of different learning tools, but do not produce good examination results. Skillful students seem to do well even without using a lot of tools. Thus, the current way at TUT, where students work on their remedial mathematics problems on their own could be developed further. Some change is needed, and one suggestion is using testing to ensure that the remedial training has had the desired effect.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mathematics, Research group: MAT Intelligent Information Systems Laboratory, Research group: MAT Positioning

Contributors: Myllykoski, T., Pohjolainen, S., Ali-Löytty, S.

Publication date: 16 Sep 2016

### Host publication information

Title of host publication: SEFI 2016 Annual Conference Proceedings : Engineering Education on Top of the World: Industry University Cooperation

Publisher: European Society for Engineering Education SEFI

ISBN (Electronic): 9782873520144

Keywords: math-bridge, mathematics teaching, e-learning

URLs:

[http://www.sefi.be/conference-2016/papers/Mathematics\\_and\\_Engineering\\_Education/myllykoski-students-use-of-learning-tools-and-tool-types-in-solving-self-study-assignments-93\\_a.pdf](http://www.sefi.be/conference-2016/papers/Mathematics_and_Engineering_Education/myllykoski-students-use-of-learning-tools-and-tool-types-in-solving-self-study-assignments-93_a.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Electronic Exam in Electronics Studies**

Electronic exams will become more common the following years as new students studying at universities are more and more used to digital devices. Students' working methods as well as the teaching will thus be digitalized, which will directly create expectations of and requirements for teaching and exams in universities. Thus, electronic exam systems need to take into account the needs of different users and the various features needed by the different fields.

This paper introduces an electronic exam project that has been carried out by the department of Electronics and Communications Engineering at Tampere University of Technology during academic years 2014 – 2015 and 2015 – 2016. In this project the final exam of a pilot course in electronics intermediate studies was implemented with EXAM electronic exam system. The EXAM system has been developed in cooperation with Finnish universities and universities of applied sciences. The results presented in the paper are based on the feedback that was gathered from the participated students. The results of this project indicate that flexibility of scheduling is one of the key advantages of electronic exams. As electronic exams enable the possibility for students to choose their exam time, overlapping of exams is avoided and students have more time to prepare for exams. The results also confirm that with a computer answering essay questions is pleasant and quick, and due to computer's text editing options the essay answers are more structured than in pen-and-paper exams. In electronics studies mathematical problem solving is an integral part of studies, and this needs to be taken into consideration when designing and executing electronic exams. According to the results of this project the EXAM electronic exam system has not been able to meet these demands as satisfyingly as hoped. However, students, who used MATLAB software in the electronic exam, considered the software helpful when solving mathematical problems. The possibility to use software as part of an exam is thus another key advantage of electronic exams.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Personal Electronics Group, Research group: Wireless Identification and Sensing Systems Research Group, Tampere University of Technology IT Services Teaching and Learning Services

Contributors: Laine, K., Sipilä, E., Anderson, M., Sydänheimo, L.

Number of pages: 10

Publication date: 15 Sep 2016

#### **Host publication information**

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[http://www.sefi.be/conference-2016/papers/Engineering\\_Education\\_Research\\_\\_I\\_feel\\_brilliant/laine-electronic-exam-in-electronics-studies-9.pdf](http://www.sefi.be/conference-2016/papers/Engineering_Education_Research__I_feel_brilliant/laine-electronic-exam-in-electronics-studies-9.pdf)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Developing Learning and Teaching in Engineering Mathematics with and without Technology**

University teachers of mathematics have begun to observe that nowadays new students when beginning their studies do not have as good a mathematical proficiency as before. The phenomenon has been noticed in all western countries during recent decades [1, 2]. What shall we do? We think that there are at least two available courses of action for improved learning results in university mathematics: 1) to identify as soon as possible the students who have an insufficient knowledge base in mathematics, and to begin remedial instruction for them, and 2) to develop mathematics learning environments both with and without technology.

The aim of this paper is to describe how Tampere University of Technology (TUT) has developed learning environments in mathematics during the last decade. We focus in the paper on two cases: 1) a multisemiotic approach to mathematical concepts and procedures, and 2) computer aided assessment and learning systems.

The first case consists of developing studies in mathematical exercises in which new kinds of problem-solving have been constructed. In the second case new students have participated in an ICT –based basic skills test at the beginning of their mathematics studies, to enable them to practice mathematical procedures in solving processes [3]. Electronic and web-based tools make it possible for students to learn independently at any time, and for teachers, offer an effective way to evaluate students' proficiency.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Mathematics, Research group: MAT Positioning, Research group: Positioning, Research group: MAT Intelligent Information Systems Laboratory

Contributors: Joutsenlahti, J., Ali-Löytty, S., Pohjolainen, S.

Publication date: 15 Sep 2016



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Publisher: European Society for Engineering Education SEFI  
ISBN (Electronic): 9782873520144  
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[http://www.sefi.be/conference-2016/papers/Mathematics\\_and\\_Engineering\\_Education/joutsenlahti-developing-learning-and-teaching-in-engineering-mathematics-with-and-without-technology-153\\_a.pdf](http://www.sefi.be/conference-2016/papers/Mathematics_and_Engineering_Education/joutsenlahti-developing-learning-and-teaching-in-engineering-mathematics-with-and-without-technology-153_a.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Implementing of Activating Learning Strategy for a Course on Electric Drives

Effective teaching of electric drives is highly important for the electrical engineers, because almost half of the global produced electrical energy is consumed by electric motor drives. Electric drives are a key technology for reducing energy consumption of industrial processes, for wind power generation and for electric transportation. The pedagogical premise is to improve the educational methods of an Electrical Drives course by activating students to work on their own. The paper describes the educational strategy and course objectives. Student feedback was collected at the end of the course and the results of the evaluation are summarized.

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Electrical Engineering, Research area: Power engineering  
Contributors: Rekola, J., Suntio, T.  
Number of pages: 8  
Pages: 1-8  
Publication date: 14 Sep 2016

### Host publication information

Title of host publication: SEFI 2016 Annual Conference Proceedings : Implementing of Activating Learning Strategy for a Course on Electric Drives  
Publisher: European Society for Engineering Education SEFI  
ISBN (Electronic): 9782873520144  
Keywords: Electrical engineering education , variable speed drives , simulation, laboratory  
Electronic versions:

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URLs:

<http://urn.fi/URN:NBN:fi:ty-201709201900>

<http://sefibenvvh.cluster023.hosting.ovh.net/wp-content/uploads/2017/09/rekola-implementing-of-activating-learning-strategy-for-a-course-28.pdf>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Affective experiences and student engagement in higher education

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Information Management and Logistics, Research group: Novi, Language Centre, Managing digital industrial transformation (mDIT), Tampere University of Applied Science  
Contributors: Helander, N., Boedeker, M., Hellsten, P., Jussila, J., Myllärniemi, J., Tukiainen, M.  
Publication date: 13 Sep 2016

### Host publication information

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Place of publication: Tampere

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ASJC Scopus subject areas: Education

Keywords: Affective experience, Higher Education

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[http://www.sefi.be/conference-2016/papers/Engineering\\_Skills/helander-affective-experiences-and-student-engagement-in-higher-education-178\\_a.pdf](http://www.sefi.be/conference-2016/papers/Engineering_Skills/helander-affective-experiences-and-student-engagement-in-higher-education-178_a.pdf)

URLs:

<http://www.tut.fi/en/sefi-annual-conference-2016/index.htm>

### **Students as mystery shoppers: lowering knowledge sharing barriers in higher education**

This empirical research paper focuses on discussing potential knowledge sharing barriers volunteering students as mystery shoppers perceived in the context of higher education. More specifically, the focus is on students' ideas on finding solutions to lowering individual knowledge sharing barriers, i.e. improving the quality of their instruction.

Mystery shopping is a method of observing service performance from the user, or customer, perspective and it has been widely used to evaluate the overall service quality within service businesses. Using empirical data from students volunteering as mystery shoppers appears not as a widely used research and development tool.

Moreover, there is little context-specific research on learning and teaching in such a knowledge intensive community like a university from the perspective of knowledge management (KM). KM offers thus a useful approach for analysing learning and teaching, as well as improving the processes of knowledge creation.

A Finnish technical university and its student union organised a mystery shopping project with 45 student participants.

They observed their learning experiences for six weeks in order to complement data from other sources. The students kept a casual theme-based diary on four larger topics: teaching staff and teaching (including pedagogical competence and teaching culture, instruction and guidance, course arrangements), students and the learning culture, student services and learning environment. The initial goal of the project was to add a student voice on the processes of developing learning and teaching in higher education.

The research approach represents qualitative content analysis in which knowledge-sharing barriers were first recognised from the qualitative mystery shopper data. Next those instances where the students offered their solution to lowering that barrier were selected for further analysis. The results identify learner suggestions that may contribute to lowering knowledge sharing barriers. Result also indicate that individual knowledge sharing barriers as described in the literature appear to be valid in a higher education setting.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Language Centre

Contributors: Tukiainen, M. O.

Publication date: 13 Sep 2016

#### **Host publication information**

Title of host publication: 44th Annual Conference Of The European Society For Engineering Education : 12-15 September 2016, Tampere, Finland

Place of publication: Tampere

ISBN (Electronic): 978-2-87352-012-0

ASJC Scopus subject areas: Education

URLs:

[http://www.sefi.be/conference-](http://www.sefi.be/conference-2016/papers/Continuing_Engineering_Education_and_Lifelong_Learning__Engineering_Education_Research/tukiainen-students-as-mystery-shoppers-168_a.pdf)

[2016/papers/Continuing\\_Engineering\\_Education\\_and\\_Lifelong\\_Learning\\_\\_Engineering\\_Education\\_Research/tukiainen-students-as-mystery-shoppers-168\\_a.pdf](http://www.sefi.be/conference-2016/papers/Continuing_Engineering_Education_and_Lifelong_Learning__Engineering_Education_Research/tukiainen-students-as-mystery-shoppers-168_a.pdf)

URLs:

<http://www.tut.fi/tietoa-yliopistosta/uutiset-ja-tapahtumat/tapahtumat/sefi2016-44th-annual-conference-of-the-european-society-for-engineering-education-x111754>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **New introductory courses and teacher tutoring: Keys to an efficient beginning for university studies in engineering**

Becoming a university student is a big transition for a college student. Everything is

new; places, practicalities, regulations, and the ropes have to be adopted quickly. At the same time, the requirements of working life and need for better generic skills after graduation have been elevated to general discussion.

To meet these challenges, the orientation and beginning of studies in Tampere University of Technology were renewed in 2013. In Faculty of Computing and Electrical Engineering, we tried to achieve better study experience for our students, better study success during first year studies and further bachelor's degree. Our methods were to adopt systematic teacher tutoring and to focus on co-working in smaller student groups as well as combine generic skills to technological skills in two new introduction courses in the beginning of university studies. The courses were planned to give as much support in generic skills development as possible.

Our results have been very promising so far. The amount of ECTS credits as well as passing rates of compulsory courses during the first year have improved. Also the student feedback of the courses has been very good.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Identification and Sensing Systems Research Group, Teaching and Learning Services, Department of Pervasive Computing, Research area: Computer engineering, Tampere University of Technology

Contributors: Ketola, S., Sipilä, E., Pajarre, E., Takala, J.

Publication date: 12 Sep 2016

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Keywords: engineering education

URLs:

[http://www.sefi.be/conference-2016/papers/Engineering\\_Skills/ketola-new-introductory-courses-and-teacher-tutoring-13\\_a.pdf](http://www.sefi.be/conference-2016/papers/Engineering_Skills/ketola-new-introductory-courses-and-teacher-tutoring-13_a.pdf)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Towards better learning by increased student engagement

Three basic courses obligatory in the bachelor studies of civil engineering were redesigned to increase the student engagement and to support the continuous learning through increased interaction and feedback. Two new courses on geotechnical engineering and soil mechanics were created summing up to the same total credits as the three old courses on engineering geology, soil investigations and soil mechanics.

The analysis of the learning outcomes and the core content formed the base of the development work. Good components, such as soil laboratory and field exercises enabling learning by going and giving memorable experiences, as graduated students commented, were retained, but developed further to enable the self-directed group work and flipped learning. The calculation exercise groups in soil mechanics course were cut down into smaller groups to support collateral learning and to dissipate the gap between the teacher and student. Personal design calculation assignments were added with direct feedback. Weekly moodle quizzes were used to motivate the continuous learning and the lecture attendance.

The results after two and three implementations of the new courses were analysed based on the grades, passing percentage and student feedback, comparing the three old courses with the two new courses. Based on the both the grades and the passing percentage the learning results were improved. Especially the number and achieved grades of student passing with the interval exams on soil mechanics course were improved significantly. In the new basic course, where the final exam is no longer compulsory, the result is not as evident, since during the first two implementations the highest grade possible to achieve by assignments was three.

One important achievement was improving the reputation of these courses. Senior students pass on their attitudes to the young, and created prejudices effect on the student's performance. It takes several years to chance the image. Therefore, it's important to react to the student feedback and to make the development work and teacher's interest visible to the students.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Earth Constructions

Contributors: Kuula, P. H., Leppänen, M. M., Penttilä, M. E.

Number of pages: 10

Publication date: 12 Sep 2016

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Publisher: European Society for Engineering Education SEFI

Editors: Niemi, T., Järvinen, H.

ISBN (Print): 978-2-87352-014-4

Keywords: active learning, learning by doing, engineering education, blended learning, evaluation method

URLs:

<http://www.tut.fi/en/sefi-annual-conference-2016/welcome-to-tampere/index.htm>

[http://www.sefi.be/conference-](http://www.sefi.be/conference-2016/papers/Open_and_Online_Engineering_Education__Engineering_Education_Research/kuula-towards-better-learning-by-increased-student-engagement-69.pdf)

[2016/papers/Open\\_and\\_Online\\_Engineering\\_Education\\_\\_Engineering\\_Education\\_Research/kuula-towards-better-learning-by-increased-student-engagement-69.pdf](http://www.sefi.be/conference-2016/papers/Open_and_Online_Engineering_Education__Engineering_Education_Research/kuula-towards-better-learning-by-increased-student-engagement-69.pdf)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## **Industrial impact on topics and types of Master's theses: Empirical study of software engineering theses made in 1990-2016**

One of the ways universities and industry co-operate is making the master's theses on the topics of industrial partners. In this paper 578 theses on software engineering from 1990 until 2016 are evaluated to see how the needs of the industry on information technology in Finland have affected the topics, type, language and orientation of the theses. Also the size of the company and the gender of students were recorded as well. All the theses have been supervised by either of the authors and they represent about 30 percent of theses on software engineering at Tampere University of Technology.

Our strongest hypothesis was that during 2000-2005 golden era of Nokia would affect greatly on the numbers so that the major part of the theses were made for a large company, mobility is one of the most general topics and there are several constructive theses that are part of bigger projects. Other initial hypotheses were that the number of theses in English has been increased since 1990, the number of females has been the same or increasing slightly, and the orientation of the theses (constructive or research-oriented) has not changed much, the constructive ones being much more common.

The results partly proved the hypotheses, but interestingly enough, we got some surprises especially on the language of the theses and the gender on students.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: Software engineering

Contributors: Järvinen, H., Mikkonen, T.

Number of pages: 11

Publication date: 12 Sep 2016

### **Host publication information**

Title of host publication: Proceedings of SEFI 2016 Annual Conference

Publisher: European Society for Engineering Education SEFI

Editors: Järvinen, H., Clark, R.

ISBN (Electronic): 9782873520144

ASJC Scopus subject areas: Computer Science(all)

Keywords: software engineering education, thesis, industrial impact

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<http://sefibenvwh.cluster023.hosting.ovh.net/wp-content/uploads/2017/09/jarvinen-industrial-impact-on-topics-and-types-of-masters-theses-95.pdf>

<http://urn.fi/URN:NBN:fi:tyy-201709151888>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## **Validating information security framework for offloading from LTE onto D2D links**

D2D communications is one of the key technologies to enable aggressive spatial frequency reuse in future evolution of cellular systems. While the standardization efforts are far from their final stage there is clear understanding that security is one of the major concerns for proximity services. This is especially the case when one or more communicating stations in a logical cluster do not have an active connection to the serving base station. In this paper we propose a solution for secure throughput optimized communications in D2D-assisted cellular system. In order to provide additional throughput, a game-theoretic optimization approach is considered by taking into account social relationships and devices proximity. The proposed solution is agnostic to the chosen D2D communications technology (i.e., WiFi or LTE) and suitable for any possible cluster combination in full and partial cellular coverage. Performance evaluation of the proposed security framework show that social proximity information available at the D2D devices may substantially improves the system performance in term of throughput with respect to the standard security procedures. Finally, for sake of completeness, the effect of mobility for the reference scenario is evaluated.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Università degli Studi di Reggio Calabria

Contributors: Orsino, A., Ometov, A.

Number of pages: 7

Pages: 241-247

Publication date: 6 Sep 2016

### **Host publication information**

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ISBN (Electronic): 9789526839721

ASJC Scopus subject areas: Computer Science(all), Electrical and Electronic Engineering

DOIs:

10.1109/FRUCT-ISPIT.2016.7561534

Source: Scopus

Source ID: 84989166036

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Handheld wireless authentication key and secure documents storage for the Internet of Everything**

In this paper, a novel approach for user authentication in Internet of Everything, called 'wireless key' is studied. While the majority of existing solutions suggest a wireless key to be a battery-powered device with considerable computational power, we propose to use passive NFC tags instead. In our approach, all the computations are performed by the service the user is authenticating to and thus no computational power and no battery on the key side is required. This approach allows minimizing the device size and significantly reducing the costs. To ensure security of data stored on the tag we propose a transparent data encryption mechanism constructed on top of strong cryptographic primitives. In addition to the authentication-related feature, we have designed a system that enables secure storage of documents on the same tag making it capable of saving ID cards, bank cards, licenses, etc. The presented approach allows on-the-fly validation of any stored document by the entity that issued it as well as by any other entity granted such permissions. Correctness and a security level of the system have been assessed via the analytical study and validated through a hardware prototype. The algorithms and protocols described in the paper are also applicable to any other carrier technology including Bluetooth Low Energy and Wireless USB.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Emerging Technologies for Nano-Bio-Info-Cogno, Department of Electronics and Communications Engineering, Yaroslavl State University, University of Goettingen

Contributors: Komar, M., Edelev, S., Koucheryav, Y.

Number of pages: 11

Pages: 120-130

Publication date: 6 Sep 2016

#### **Host publication information**

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ASJC Scopus subject areas: Computer Science(all), Electrical and Electronic Engineering

DOIs:

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Source: Scopus

Source ID: 84989154385

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Knowledge barriers in university-industry knowledge networks**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Information Management and Logistics, Research group: Novi

Contributors: Vuori, V., Helander, N.

Number of pages: 8

Pages: 952-959

Publication date: 2 Sep 2016

#### **Host publication information**

Title of host publication: 17th European Conference on Knowledge Management, At Belfast, Northern Ireland, UK. : 1-2 Sep. 2016

Publisher: Academic Conferences and Publishing International Limited Reading

ISBN (Electronic): 978-1-911218-03-6

URLs:

<http://www.academic-conferences.org/conferences/eckm/future-past-conferences/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Increasing the environment-awareness of rake beamforming for directive acoustic sources**

Speech signals captured by distant microphones in enclosures are typically deteriorated by reverberation and background noise. Commonly, the quality of the signals is enhanced applying delay and sum beamforming (or variants) to a microphone array. However, under particular conditions, the multi-path acoustic propagation leading to reverberation is not completely detrimental and can be used in a constructive way. In this direction, mirrored (virtual) microphones have been successfully applied in various research areas. In addition, the majority of naturally occurring sound sources, such as the human speaker, presents a certain degree of radiation directivity, which, coupled with data-independent beamforming, has been shown to slightly increase the captured speech quality.

Building upon the concepts of environment awareness and the acoustic rake receiver, this paper investigates the use of mirrored microphones, associated to isolated and strong reflections, in combination with source directivity, to further improve the captured speech quality. Real-data gathered with a linear nested array, as well as simulated data, are used to test the proposed scheme, showing superior performance with respect to similar state of the art solutions.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Signal Processing, Research group: Audio research group, Fondazione Brune Kessler

Contributors: Pertilä, P., Brutti, A.

Publication date: 1 Sep 2016

#### **Host publication information**

Title of host publication: 15th International Workshop on Acoustic Signal Enhancement (IWAENC)

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URLs:

<http://www.iwaenc2016.org/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **DCASE 2016 Acoustic Scene Classification Using Convolutional Neural Networks**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Signal Processing, Research group: Audio research group

Contributors: Valenti, M., Diment, A., Parascandolo, G., Squartini, S., Virtanen, T.

Publication date: 1 Sep 2016

#### **Host publication information**

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Publisher: Tampere University of Technology. Department of Signal Processing

ISBN (Electronic): 978-952-15-3807-0

Keywords: Acoustic scene classification, convolutional neural networks, DCASE, computational audio processing

URLs:

<http://www.cs.tut.fi/sgn/arg/dcase2016/documents/workshop/Valenti-DCASE2016workshop.pdf>

<http://urn.fi/URN:ISBN:978-952-15-3807-0>

Source: Bibtext

Source ID: urn:c2fdc060aad74381513299d25e4a3052

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Strengthening student engagement by integrating the contents of a flipped course around a well-confined real life theme**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: RF Integrated Circuits

Contributors: Kangas, J., Lunden, O.

Number of pages: 9

Publication date: Sep 2016

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Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **MathCheck: a tool for checking math solutions in detail**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mathematics, Research group: MAT Computer Science and Applied Logics

Contributors: Valmari, A., Kaarakka, T.

Publication date: Sep 2016

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Title of host publication: SEFI 2016 Annual Conference Proceedings : Engineering Education on Top of the World: Industry University Cooperation

Publisher: European Society for Engineering Education SEFI

ISBN (Print): 9782873520144

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Integrating mobile orienteering to team forming activity in a software engineering course**

One of the most important skills software engineers need when entering work life is working in teams, including communicating, collaborating, as well as coordinating work in a team. This paper presents a team building activity aiming to support the first phases of team formation with a mobile orienteering activity. Created tasks at orienteering checkpoints were related to communication, collaboration and work division. Students were enthusiastic about the activity and expressed in their group reports on the activity that it supported the team building activity well, helped break the ice and supported agreeing the ways of working. Students also liked getting out of the classroom. The approach seems promising and we will investigate in the future similar type of activities in the first phases of team formation as well as will explore further integrating physical activity to the exercise sessions.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: User experience

Contributors: Väättäjä, H., Ahtinen, A.

Publication date: Sep 2016

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Title of host publication: SEFI 2016 Annual Conference Proceedings : Engineering Education on Top of the World: Industry University Cooperation

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ISBN (Electronic): 9782873520144

Keywords: soft skills, engineering skills, collaboration, Team working, group forming, mobile orienteering, team forming  
URLs:

[http://www.sefi.be/conference-2016/papers/Engineering\\_Skills/vaataja-integrating-mobile-orienteering-to-team-forming-activity-176.pdf](http://www.sefi.be/conference-2016/papers/Engineering_Skills/vaataja-integrating-mobile-orienteering-to-team-forming-activity-176.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Finnish Engineering Education for Sustainable Development in 2016 - Call for collaborative learning**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, The Education Fund

Contributors: Takala, A., Korhonen-Yrjänheikki, K.

Publication date: Sep 2016

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Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Capturing knowledge from research projects: From project reports to storytelling**

Research projects are essential tools for creating knowledge and fueling societal developments. Consequently, research efforts are consistent with requirements from accepted scientific methods as they are exhaustively recorded and stored. Traditional approaches are equally effective in helping assess the robustness of research methods. However, approaches to recording research projects leave behind a wealth of tacit knowledge and contextual information. Tacit knowledge and contextual information are essential to enable the development of individual researchers and research teams, which in turn have the potential to increase productivity, effectiveness and impact of future research. Found within the project management literature is the idea of utilizing storytelling to record projects' lessons learned. This paper's main research question is "how would a storytelling framework for capturing and sharing knowledge and contextual information improve organizational memory and the management of research projects?" The framework will be piloted at Canadian, Finnish, and Japanese universities. The effectiveness of the framework will be assessed by comparing it with established procedures to record research projects. In terms of organization, this paper will include a review of the literature, a description of the logic and application of the framework, findings from pilot studies, next steps, and opportunities for future research.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Innovation and Technology Research

Contributors: Machado, M. A., Magnier-Watanabe, R., Peltola, T.

Number of pages: 10

Pages: 2048-2057

Publication date: Sep 2016

### **Host publication information**

Title of host publication: 2016 Portland International Conference on Management of Engineering and Technology (PICMET)

Publisher: IEEE

ISBN (Print): 978-1-5090-3595-3

Keywords: Technological innovation, Technology management

DOIs:

10.1109/PICMET.2016.7806602

Source: Bibtex

Source ID: urn:e6b6fba93971fe08c9732ef2e4b6d809

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Simulation studies of DFB laser longitudinal structures for narrow linewidth emission**

Simulation studies targeting high-power narrow-linewidth emission from DFB lasers are presented. The linewidth and output power calculations take into account the mirror losses, including the grating and the facets, as well as spontaneous emission noise, effective refractive index, power and carrier density variations inside the cavity. The longitudinal power and carrier density distributions have been evaluated and their effects on longitudinal spatial hole burning and possible side mode lasing are discussed.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications

Contributors: Virtanen, H., Uusitalo, T., Dumitrescu, M.

Number of pages: 2

Pages: 153-154

Publication date: 17 Aug 2016

### **Host publication information**

Title of host publication: 16th International Conference on Numerical Simulation of Optoelectronic Devices, NUSOD 2016

Publisher: IEEE

ISBN (Electronic): 9781467386036

ASJC Scopus subject areas: Electrical and Electronic Engineering, Electronic, Optical and Magnetic Materials, Modelling and Simulation, Numerical Analysis



DOIs:

10.1109/NUSOD.2016.7547078

Source: Scopus

Source ID: 84987641768

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Transverse structure optimization of laterally-coupled ridge waveguide DFB lasers**

A new figure of merit for single transverse mode operation and an accurate procedure for calculating the coupling coefficient in distributed feedback lasers with laterally-coupled ridge waveguide surface grating structures are introduced. Based on the difference in optical confinement between the pumped and un-pumped regions in the transverse plane, the single transverse mode figure of merit is effective and easy to calculate, while the improved coupling coefficient calculation procedure gives experimentally confirmed better results than the standard calculation approaches.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications

Contributors: Uusitalo, T., Virtanen, H., Dumitrescu, M.

Number of pages: 2

Pages: 79-80

Publication date: 17 Aug 2016

#### **Host publication information**

Title of host publication: 16th International Conference on Numerical Simulation of Optoelectronic Devices, NUSOD 2016

Publisher: IEEE

Article number: 7547038

ISBN (Electronic): 9781467386036

ASJC Scopus subject areas: Electrical and Electronic Engineering, Electronic, Optical and Magnetic Materials, Modelling and Simulation, Numerical Analysis

DOIs:

10.1109/NUSOD.2016.7547038

Source: Scopus

Source ID: 84987653468

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Simulation of photon-photon resonance enhanced direct modulation bandwidth of DFB lasers**

Simulations and experimental results of high-frequency photon-photon resonance are used to examine the possibilities to extend the direct modulation bandwidth in dual-mode distributed feedback lasers beyond the conventional limit set by the carrier-photon resonance.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications, Brighterwave Inc, Politecnico di Torino

Contributors: Dumitrescu, M., Uusitalo, T., Virtanen, H., Laakso, A., Bardella, P., Montrosset, I.

Number of pages: 2

Pages: 147-148

Publication date: 17 Aug 2016

#### **Host publication information**

Title of host publication: 16th International Conference on Numerical Simulation of Optoelectronic Devices, NUSOD 2016

Publisher: IEEE

ISBN (Electronic): 978-1-4673-8603-6

ASJC Scopus subject areas: Electrical and Electronic Engineering, Electronic, Optical and Magnetic Materials, Modelling and Simulation, Numerical Analysis

DOIs:

10.1109/NUSOD.2016.7547075

#### **Bibliographical note**

EXT="Laakso, A."

Source: Scopus

Source ID: 84987641496

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Implementation Experiences and Design Challenges for Resilient SDN Based Secure WAN Overlays**

Mobile computing devices, industrial control systems, and service provider clouds often need to be connected to each other over wide area networks. However, reliability, quality of services and confidentiality are challenging in such setups. Moreover, isolated appliances and physical equipment face harsh environment conditions. In this paper we explore designing secure layer 2 overlay networks using Software Defined Networking (SDN), and challenges in implementing them with open source tools.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: Information security

Contributors: Vajaranta, M., Kannisto, J., Harju, J.

Number of pages: 7

Pages: 17-23

Publication date: 4 Aug 2016

#### **Host publication information**

Title of host publication: 2016 11th Asia Joint Conference on Information Security (AsiaJCIS)

Publisher: IEEE

ISBN (Electronic): 978-1-5090-2285-4

DOIs:

10.1109/AsiaJCIS.2016.25

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Observing Hidden Service Directory Spying with a Private Hidden Service HoneyNet**

Tor's location hidden services (HS) are a tool for anonymous publishing, with the feature that the sites cannot be brought down without taking down the whole Tor network. People run HSs for a multitude of reasons. Some like them to be public, but others want to keep them their existence as private. We have run private unannounced HSs to detect whether the HS directory is spied on. Our results show that the hidden service directory is monitored for new addresses. This paper details the observations made from the scanning activity.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: Information security

Contributors: Nurmi, J., Kannisto, J., Vajaranta, M.

Pages: 55-59

Publication date: 4 Aug 2016

#### **Host publication information**

Title of host publication: Proceedings of the 11th Asia Joint Conference on Information Security (AsiaJCIS 2016),

Fukuoka, Japan, August 4-5, 2016

ISBN (Electronic): 978-1-5090-2285-4

DOIs:

10.1109/AsiaJCIS.2016.31

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Home Network Security: Modelling Power Consumption to Detect and Prevent Attacks on Homenet Routers**

Future home networks are expected to become extremely sophisticated, yet only the most technically adept persons are equipped with skills to secure them. In this paper, we provide a novel solution to detect and prevent attacks on home routers based on anomalous power consumption. We developed a means of measuring power consumption that could be used in a wide variety of home networks, although our primary focus on is on profiling Homenet-based residential routers, specifically to detect attacks against homenet routing infrastructure. Several experimental results are presented when the infrastructure is exposed to various types of attacks, which show strong evidence of the feasibility of our approach.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: Information security

Contributors: Silverajan, B., Vajaranta, M., Kolehmainen, A.

Pages: 9-16

Publication date: 4 Aug 2016

### Host publication information

Title of host publication: Proceedings of the 11th Asia Joint Conference on Information Security (AsiaJCIS 2016), Fukuoka, Japan, August 4-5, 2016

Publisher: IEEE

ISBN (Electronic): 978-1-5090-2285-4

DOIs:

10.1109/AsiaJCIS.2016.10

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Third places and user preferences – affordances in the cities

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering

Contributors: Nenonen, S., Rahtola, R., Kojo, I.

Number of pages: 9

Pages: 17-25

Publication date: 1 Aug 2016

#### Host publication information

Title of host publication: Proceedings of CFM's Second Nordic Conference: Facilities Management Research and Practice; : 29-30 AUGUST 2016, Denmark

Editor: Jensen, P. A.

ISBN (Print): 9788750211044

Keywords: workspace management, new ways of working, discourse, typologies, spatial transformation

URLs:

<http://www.cfm.dtu.dk/english/CFM-SECOND-NORDIC-CONFERENCE-2016>

Source: Bibtex

Source ID: urn:cdf1ee83af90706e85ce79e70d9e4a36

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Study on the capability to measure stakeholders' brand experiences with a consumer-centric measurement framework

The target of this paper is to introduce a general brand experience measurement scale that can be used to measure brand experiences of the stakeholders of a company. It is proposed that also stakeholders' brand experiences can be measured with a measurement scale developed for consumer marketing research.

In literature, there are various different kinds of individual brand constructs and measurement frameworks that have been developed for tracking consumers' brand perceptions; however, these models have not been frequently used to measure brand-related aspects outside consumer-centric situations. The tracking of stakeholders' brand experiences can help companies to position their brands better in the tightening global competition where also stakeholders have a critical role and can influence the performance of the company (Hult, Mena, Ferrell, & Ferrell, 2011).

Brands are experienced via stimuli that can be either controlled by the company, including, for example, advertisements, logos, sales environments, sales packages, and services, or then they are out of their control, for example, brand related information can spread freely on the social media or by word-of-mouth (Brakus, Schmitt, & Zarantonello, 2009; Keller, 2013). Thus, it can be said that the measurement of brand experiences can give valuable information to the company on what is the status and reputation of the brand. However, it is not only the customers or consumers that have brand experiences, also stakeholders encounter brands and the way they experience them on the personal level can have a major impact on how they interact and promote the brand in other contexts. Some B2B marketing theories have brought up the importance of understanding long-term relationships between buyers and sellers, including experiences associated with the relationship (Hadjikhani & LaPlaca, 2013) as well as purchase risks (Brown, Zablah, Bellenger, & Johnston, 2011).

Brand experiences can be measured, for example, with a measurement scale (Brakus et al., 2009) that has been extended with an eco-friendliness dimension (Saari, 2016). This model has been tested with consumers, and this paper argues that the same scale can be useful for monitoring the brand experiences of other stakeholders as well. The extended brand experience scale can be used to monitor whether consumers and stakeholders experience a certain brand to be ecofriendly, and how positively or negatively they are inclined towards the eco-friendliness of the brand experiences.

With the raising focus on stakeholders' important role in solving environmental problems, the role of stakeholder marketing becomes more critical for a company (Homburg, Stierl, & Bornemann, 2013). And in this situation it becomes also more crucial to follow up what are the brand experiences of stakeholders. The stakeholders' brand experiences can give a strong indication is the company implementing its strategy correctly and are all the essential elements transparently and authentically communicated to the stakeholders, especially with regard to the environmental development activities that are reflected in the eco-friendliness dimension of brand experiences. Keywords: brand experience; brand measurement scales; stakeholders' brand experiences; stakeholder marketing

#### References:

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- Saari, U. (2016). *Eco-Friendliness in the Brand Experience of High-Tech Products*. Tampere University of Technology, Tampere, Finland.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Industrial Management, Research group: Center for Innovation and Technology Research  
Contributors: Saari, U., Mäkinen, S.  
Number of pages: 2  
Pages: 1034-1035  
Publication date: 20 Jul 2016

#### Host publication information

Title of host publication: Global Marketing Conference Proceedings 2016 Hong Kong, July 21 - 24 : Track: Stakeholders-brand Relationships

#### Publication series

Name: Proceedings of the Global Marketing Conference  
ISSN (Print): 1976-8699  
Keywords: brand experience, brand experience measurement, brand measurement scale, stakeholders' brand experiences, stakeholder marketing  
URLs:  
<http://gammaconference.org/2016/?ckattempt=1>  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Customer value management framework for supply chains

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Information Management and Logistics  
Contributors: Ala-Maakala, M., Liimatainen, H.  
Number of pages: 10  
Pages: 447-456  
Publication date: 4 Jul 2016

#### Host publication information

Title of host publication: The proceedings of 21st international symposium on logistics (ISL 2016) : Sustainable transport and supply chain innovation, Kaohsiung, Taiwan 3-6 July 2016  
Editor: Pawar, K.  
ISBN (Electronic): 9780853583172  
URLs:  
<http://www.isl21.org/wp-content/uploads/2016/06/ISL-Proceedings-2016.pdf>  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### In vivo single-molecule dynamics of transcription of the viral T7 Phi 10 promoter in *Escherichia coli*

We study the dynamics of transcription initiation of the T7 Phi 10 promoter as a function of temperature, using quantitative polymerase chain reaction (qPCR) and in vivo single-cell, single-ribonucleic acid (RNA) time-lapse microscopy. First, from the mean and squared coefficient of variation of the empirical distribution of intervals between consecutive RNA appearances in individual cells, we find that both the mean rate and noise in RNA production increase with temperature (from 20 °C to 43 °C). Next, the process is shown to be sub-Poissonian in all conditions, suggesting the existence of more

than one rate-limiting step and absence of a significant ON-OFF mechanism. Next, from the kinetics of RNA production for varying amounts of T7 RNA polymerases, we find that as temperature increases, the fraction of time that the T7 RNA polymerase spends in open complex formation increases relative to the time to commit to closed complex formation, due to changes in the kinetics of open complex, closed complex, and reversibility of the closed complex formation. We conclude that the initiation kinetics of the T7 Phi 10 promoter changes with temperature due to changes in the kinetics of its rate-limiting steps.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Laboratory of Biosystem Dynamics-LBD , CA3, UNINOVA - Centre of Technology and Systems, Faculdade de Ciências e Tecnologia da Universidade Nova, Universidade de Lisboa

Contributors: Goncalves, N. S., Martins, L., Tran, H., Oliveira, S. M., Neeli-Venkata, R., Fonseca, J., Ribeiro, A. S.

Pages: 9-15

Publication date: 26 Jun 2016

#### Host publication information

Title of host publication: The 8th International Conference on Bioinformatics, Biocomputational Systems and Biotechnologies (BIOTECHNO2016)

Publisher: IARIA

ISBN (Electronic): 978-1-61208-488-6

URLs:

[https://www.thinkmind.org/index.php?view=article&articleid=biotechno\\_2016\\_1\\_20\\_60014](https://www.thinkmind.org/index.php?view=article&articleid=biotechno_2016_1_20_60014)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Using a synthetic probe to study the robustness of the segregation process of protein aggregates in Escherichia coli

Even though the processes of protein production and folding are not immune to errors, Escherichia coli lineages are capable to maintain a stable cell lineage, provided viable environmental conditions. One of the internal processes that makes this possible consists of segregating unwanted protein aggregates to the cell poles by nucleoid exclusion, which, combined with cell divisions, generates asymmetries in the aging process of the population, with some individuals aging faster while others exhibit rejuvenation. A recent study showed that this process is not immune to sub-optimal temperature conditions due to increased cytoplasm viscosity, which weakens the anisotropy in aggregate displacements at the nucleoid borders. This was made possible by the usage of a synthetic fluorescent probe, consisting of a RNA sequence with multiple binding sites for the MS2-GFP synthetic protein, which can be tracked in time-lapse microscopy images. Here we provide a description of the findings from these measurements and investigate with an In Silico model the consequences in the context of cell lineages.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Faculty of Biomedical Sciences and Engineering, Research group: Laboratory of Biosystem Dynamics-LBD

Contributors: Ribeiro, A., Oliveira, S.

Pages: 21-22

Publication date: 26 Jun 2016

#### Host publication information

Title of host publication: The 8th International Conference on Bioinformatics, Biocomputational Systems and Biotechnologies (BIOTECHNO2016)

Publisher: IARIA

ISBN (Electronic): 978-1-61208-488-6

URLs:

[https://www.thinkmind.org/index.php?view=article&articleid=biotechno\\_2016\\_2\\_10\\_60012](https://www.thinkmind.org/index.php?view=article&articleid=biotechno_2016_2_10_60012)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Demolished buildings: Empirical evidence on types, ages and construction materials

Studies have found that from the ecological perspective, preservation of existing buildings is usually more sustainable than demolition and new construction. Knowledge about the characteristics of demolished buildings could help to promote renovation of buildings and to advance more sustainable management of building stocks, but so far the acquisition of comprehensive data has posed an immense challenge for research. Due to the lack of empirical evidence, the current understanding is largely based on theorizing. To participate in bridging this gap of knowledge, the current study takes advantage of data extracted from the Finnish Building and Dwelling Register. This data, which encompass all buildings demolished in Finland between 2000 and 2012 (50 818 buildings), are utilized to investigate the ages, decades of origin and construction materials and methods of demolished buildings by building types in 11 different categories from residential to non-residential. The results show that buildings are being demolished after remarkably short service lives.

On average, the demolished buildings were only 51 years old — a service life that is considered as appropriate for temporary structures in the current design guidance. Furthermore, prefabricated buildings reached lives around 20 years, which is clearly less than with in situ built buildings. The average lives of buildings made of different materials were as follows: 54 years (timber buildings), 50 years (brick buildings), 40 years (concrete buildings) and 19 years (steel buildings). A comparison to statistics covering the existing stock showed that demolition is typically underrepresented in the youngest cohorts and overrepresented in older cohorts.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: School of Architecture, Research group: Built Environment in Transition

Contributors: Huuhka, S.

Number of pages: 8

Pages: 1105-1112

Publication date: 22 Jun 2016

#### **Host publication information**

Title of host publication: CESB16 - Central Europe towards Sustainable Building 2016 : Innovations for Sustainable Future, June 22-24, 2016, Prague

Place of publication: Prague

Publisher: Czech Technical University in Prague

Editors: Hajek, P., Tywoniak, J., Lupisek, A., Sojkova, K.

ISBN (Print): 978-80-271-0248-8

ISBN (Electronic): 978-80-271-0248-8

URLs:

<http://cesb.cz/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Demolition Rates of Buildings with Different Functions and Construction Materials**

Obsolescence of buildings is a complex phenomenon. Previous research has found that demolition of buildings is primarily determined by behavioural aspects, amongst which is the use of the building. At the same time, service life design of buildings keeps focusing strongly on physical factors, such as the durability of materials. This study intends to shed light on the relationship of the building's function and material by investigating demolition rates of Finnish buildings that are made of different materials (timber, concrete, bricks, steel) and that have different functions (10 categories, both residential and non-residential). The study uses demolition data from the Finnish Building and Dwelling Register (50 818 buildings – all buildings demolished between 2000 and 2012) and statistical data on the composition of the entire building stock. According to the results, the building type seems to be more decisive than the material. The highest loss rates take place amongst warehouse buildings.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: School of Architecture, Research group: Built Environment in Transition

Contributors: Huuhka, S.

Number of pages: 7

Pages: 301-307

Publication date: 21 Jun 2016

#### **Host publication information**

Title of host publication: YRSB16 - iiSBE Forum of Young Researchers in Sustainable Building 2016 : Innovations for Sustainable Future June 21, 2016, Prague

Place of publication: Prague

Publisher: Czech Technical University in Prague

Editors: Zelezna, J., Hajek, P., Tywoniak, J., Lupisek, A., Sojkova, K.

ISBN (Electronic): 978-80-01-05979-1

URLs:

<http://www.cesb.cz/yrsb/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Knowledge integration method development for multi-stakeholder innovation**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pori Department, Research group: Business Ecosystems, Networks and Innovations

Contributors: Mäenpää, S., Suominen, A., Breite, R.  
Publication date: 21 Jun 2016

#### Host publication information

Title of host publication: Proceedings of The XXVII ISPIM Conference 2016 Porto, Portugal - 19-22 June 2016 : Blending Tomorrow's Innovation Vintage

ISBN (Electronic): 978-952-265-929-3

URLs:

[http://www.ispim.org/abstracts/The%20Proceedings%20of%20The%20XXVII%20ISPIM%20Conference%202016%20Porto,%20Portugal%20-%2019-22%20June%202016/maenpaa\\_sari.html](http://www.ispim.org/abstracts/The%20Proceedings%20of%20The%20XXVII%20ISPIM%20Conference%202016%20Porto,%20Portugal%20-%2019-22%20June%202016/maenpaa_sari.html)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Exploring how brand experience measurement could be used for integrating marketing and R&D

Based on a brand experience survey done on global mobile phone brands, we have analysed how brand experiences impact brand loyalty and are associated to prior product selections. We have created two conceptual models after doing exploratory factor analysis (EFA) on data collected from Finland (N=468). Our findings indicate that brand experiences of mobile phone brands consist of intellectual, sensory, behavioural, and eco-friendliness related aspects, and that the affective dimension that has earlier been linked to brand experiences is in fact associated more with brand loyalty. Also the perception of eco-friendliness in the brand experience can have an impact on brand loyalty and it is reflected in the product selection. Thus we suggest that integrated marketing and innovation management concentrate on improving the emotions consumers have towards a brand and measure this dimension to track how the brand has succeeded to deliver intellectual, sensory, behavioural and eco-friendliness related brand experiences.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Innovation and Technology Research

Contributors: Saari, U. A., Mäkinen, S. J.

Number of pages: 14

Publication date: 19 Jun 2016

#### Host publication information

Title of host publication: XXVII ISPIM Innovation Conference 2016 : Porto, 19-22 June, 2016

ISBN (Print): 978-952-265-929-3

Keywords: brand experience, brand experience measurement, stakeholders, product development

Electronic versions:

ISPIM2016\_Saari\_Makinen\_Exploring how brand experience measurement

URLs:

<http://urn.fi/URN:NBN:fi:tty-201607254337>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Multiple facets of innovation and business ecosystem research: the foci, methods and future agenda

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Innovation and Technology Research

Contributors: Aarikka-Stenroos, L., Peltola, T., Rikkiev, A., Saari, U.

Pages: 1-33

Publication date: 19 Jun 2016

#### Host publication information

Title of host publication: XXVII ISPIM Innovation Conference 2016 : Porto, 19-22 June, 2016

ISBN (Electronic): 978-952-265-929-3

URLs:

<http://search.proquest.com/docview/1803692429?pq-origsite=gscholar>

Source: Bibtex

Source ID: urn:de0e11bb8d4f01574e47a23803543bc1

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Customer lifetime value in manufacturing services

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Industrial Management, Research group: Cost Management Center  
Contributors: Stormi, K., Laine, T., Suomala, P.  
Publication date: 15 Jun 2016

#### **Host publication information**

Title of host publication: Proceedings of the Manufacturing Accounting Research Conference 2016 : Lisbon, Portugal, June 15-17, 2016  
Place of publication: Belgium  
Publisher: European Institute for Advanced Studies in Management EIASM  
URLs:  
[http://www.eiasm.org/frontoffice/event\\_announcement.asp?event\\_id=1155#4336](http://www.eiasm.org/frontoffice/event_announcement.asp?event_id=1155#4336)  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Management accounting and new service development under servitization: literature review and case studies**

#### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Industrial Management, Research group: Cost Management Center, Scuola Superiore Sant'Anna, Istituto di Management, Pisa, Italy  
Contributors: Tenucci, A., Laine, T.  
Publication date: 15 Jun 2016

#### **Host publication information**

Title of host publication: Proceedings of the Manufacturing Accounting Research Conference 2016 : Lisbon, Portugal, June 15-17, 2016  
URLs:  
[http://www.eiasm.org/frontoffice/event\\_announcement.asp?event\\_id=1155#4716](http://www.eiasm.org/frontoffice/event_announcement.asp?event_id=1155#4716)  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Management accounting in managerial work: engaging facts and feelings in decision making**

#### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Industrial Management, Research group: Cost Management Center  
Contributors: Saukkonen, N., Laine, T., Suomala, P.  
Publication date: 15 Jun 2016

#### **Host publication information**

Title of host publication: Proceedings of the Manufacturing Accounting Research Conference 2016 : Lisbon, Portugal, June 15-17, 2016  
Publisher: European Institute for Advanced Studies in Management EIASM

#### **Publication series**

Name:  
ISSN (Print): 2295-1709  
Name: Proceedings of the Manufacturing Accounting Research Conference  
URLs:  
[http://www.eiasm.org/frontoffice/event\\_announcement.asp?event\\_id=1155#4716](http://www.eiasm.org/frontoffice/event_announcement.asp?event_id=1155#4716)  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Does Strategic and Innovative Fit Indicate Smart Social Media use in a Company?**

#### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Information Management and Logistics, Research group: Novi, Pori Department, Research group: Business Ecosystems, Networks and Innovations, Managing digital industrial transformation (mDIT), University of Calabria  
Contributors: Jussila, J., Aramo-Immonen, H., Rouvari, O., Porkka, P., Ammirato, S.  
Number of pages: 11



Pages: 1973-1983  
Publication date: 15 Jun 2016

#### **Host publication information**

Title of host publication: Proceedings of the 11th International Forum on Knowledge Asset Dynamics : Towards a New Architecture of Knowledge: Big Data, Culture and Creativity, Dresden -Germany 15-17 June 2016

Place of publication: Dresden

Article number: 249

ISBN (Electronic): 978-88-96687-09-3

Keywords: social media, strategy, Innovation

URLs:

<http://www.knowledgeasset.org/Program/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Being a start-upper in Italy: Motivations, obstacles and success factors**

##### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pori Department, Research group: Business Ecosystems, Networks and Innovations, Department of Information Management and Logistics, Research group: Novi, Managing digital industrial transformation (mDIT), University of Calabria

Contributors: Michele Felicetti, A., Ammirato, S., Raso, C., Aramo-Immonen, H., Jussila, J.

Number of pages: 14

Pages: 1370-1383

Publication date: 15 Jun 2016

##### **Host publication information**

Title of host publication: Proceedings of the 11th forum on knowledge asset dynamics : Towards a new architecture of knowledge: big data, culture and creativity

Place of publication: Dresden

Article number: 182

ISBN (Electronic): 978-88-96687-09-3

Keywords: Start-up

URLs:

<http://www.knowledgeasset.org/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Improving the Situation Awareness of DSOs in Major Disturbances by Visualizing the State of Mobile Networks**

The interdependency of distribution and mobile networks causes issues in the recovery process of major disturbances as the mobile network is necessary for some distribution automation devices and for repair group communication. Mobile networks go down quickly after a power outage complicating the recovery process. In this paper a situation awareness (SA) system demonstration with a visualized state of both distribution and mobile networks is presented. The aim of the system is to improve the recovery times and reduce the outage costs by improving the mobile networks SA of DSOs and other actors during outages.

##### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering

Contributors: Haapanen, J., Krohns-Välimäki, H., Verho, P.

Publication date: 14 Jun 2016

##### **Host publication information**

Title of host publication: CIRED Workshop 2016

ISBN (Electronic): 978-1-78561-202-2

URLs:

[http://www.cired.net/publications/workshop2016/pdfs/CIRED2016\\_0097\\_final.pdf](http://www.cired.net/publications/workshop2016/pdfs/CIRED2016_0097_final.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Enablers and Restraints of Knowledge Work – Does profession make a difference?**

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Information Management and Logistics, Research group: Novi, University of Tampere

Contributors: Helander, N., Okkonen, J., Vuori, V., Paavilainen, N., Kujala, J.

Number of pages: 13

Pages: 40-52

Publication date: 10 Jun 2016

### Host publication information

Title of host publication: Towards a new architecture of knowledge : Big Data, culture and creativity : IFKAD 2016-11th

International Forum on Knowledge Asset Dynamics, Dresden 15-17.6.2016, Germany

ISBN (Print): 978-88-96687-09-3

URLs:

<http://10times.com/ifkad>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Adapting service-based working culture as the key driver for organisational creativity and innovation

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Information Management and Logistics

Contributors: Ketonen-Oksi, S.

Publication date: 10 Jun 2016

### Host publication information

Title of host publication: Towards a new architecture of knowledge : Big Data, culture and creativity : IFKAD 2016-11th

International Forum on Knowledge Asset Dynamics, Dresden 15-17.6.2016, Germany

ISBN (Print): 978-88-96687-09-3

URLs:

<http://10times.com/ifkad>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Single-frequency 571nm VECSEL for photo-ionization of magnesium

We report the development of an intracavity-frequency-doubled vertical external-cavity surface-emitting laser (VECSEL) emitting at 571 nm for photoionization of magnesium. The laser employs a V-cavity geometry with a gain chip at the end of one cavity arm and a lithium triborate (LBO) crystal for second harmonic generation. The gain chip has a bottom-emitting design with ten GaInAs quantum wells of 7 nm thickness, which are strain compensated by GaAsP. The system is capable of producing up to  $2.4 \pm 0.1$  W (total power in two separate output beams) in the visible. The free-running relative intensity noise was measured to be below  $-55$  dBc/Hz over all frequencies from 1 Hz to 1 MHz. With acoustic isolation and temperature regulation of the laser breadboard, the mode-hop free operation time is typically over 5 hrs. To improve the long-term frequency stability, the laser can be locked to a Doppler-free transition of molecular iodine. To estimate the short-term linewidth, the laser was tuned to the resonance of a reference cavity. From analysis of the on-resonance Hänsch-Couillaud error signal we infer a linewidth of  $50 \pm 10$  kHz. Light at 285 nm is generated with an external build-up cavity containing a  $\beta$ -barium borate (BBO) crystal. The UV light is used for loading  $25\text{Mg}^+$  ions in a surface-electrode RF Paul trap. These results demonstrate the applicability and versatility of high-power, single-frequency VECSELs with intracavity harmonic generation for applications in atomic and molecular physics.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications, National Institute of Standards and Technology, Time and Frequency Division, Boulder, Colorado

Contributors: Burd, S., Leinonen, T., Penttinen, J., Allcock, D., Slichter, D., Srinivas, R., Wilson, A., Guina, M., Leibfried, D., Wineland, D.

Number of pages: 8

Publication date: 2 Jun 2016

### Host publication information

Title of host publication: Proceedings of SPIE : Vertical External Cavity Surface Emitting Lasers (VECSELs) VI

Volume: 9734

Place of publication: San Francisco

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Article number: 973411

ISBN (Electronic): 9781628419696

#### **Publication series**

Name: SPIE Conference Proceedings

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Atomic and Molecular Physics, and Optics

Keywords: VECSEL, OPSSL, SDL, frequency doubling, SHG, ion trapping, single-frequency, photoionization, doppler-free spectroscopy, magnesium

DOIs:

10.1117/12.2213398

#### **Bibliographical note**

JUF0ID=71479

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Practice of project control under different levels of complexity in engineering projects**

Different projects require different management practices. Project control has been identified as increasingly relevant as the scope and complexity of the project and project deliverable increases. Earlier research has identified several antecedents of control differences in different projects. However, one central contingency of a project, project complexity, has received little focus in project control discussion. In addition, earlier research has focused on project control particularly in the context of information systems (IS) projects. This study explores the different approaches to project control across projects with different degrees of complexity. A qualitative embedded case study is carried out in an engineering industry firm delivering customer-specific systems and solutions. The results on the three different delivery project cases show, how the relative importance of social clan control and the intensity of control increases with the more complex projects. In addition, the importance of input control, collaborative and multi-directional control and control ambidexterity in complex projects are also highlighted. The study contributes by following a contingency approach to project management research and by obtaining results from a context seldom covered by the project control literature.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Research on Operations Projects and Services

Contributors: Vuorinen, L., Martinsuo, M.

Number of pages: 30

Publication date: 1 Jun 2016

#### **Host publication information**

Title of host publication: EURAM (European Academy of Management) conference 2016 : Manageable cooperation? June 1-4, 2016 Paris

Keywords: project complexity, project control, contingency theory

URLs:

<http://www.euram-online.org/annual-conference-2016.html>

#### **Bibliographical note**

JUF0ID=71900

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Handling exceptional situations in a distribution network congestion management algorithm**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering

Contributors: Kulmala, A., Repo, S.

Publication date: Jun 2016

#### **Host publication information**

Title of host publication: CIRED Workshop 2016

Place of publication: Helsinki, Finland

ISBN (Electronic): 978-1-78561-202-2

DOIs:

**Incremental service innovations in a manufacturing firm's delivery chain**

Manufacturing companies that provide services for consumers deliver service offerings through a retailer network. In such cases, the engagement of the various actors in the delivery chain provides multidimensional information required for successful development of services and innovations. Although the need to use delivery chain actors' differing potential in innovation has been widely recognized, the different actors' contribution to generating ideas to improve existing services is missing. This paper contributes to the literature by discussing the potential for creating these types of incremental service innovations in different parts of the delivery chain. The data were collected by interviews and questionnaires among customers, retailers and sales persons who are part of a product-related service delivery chain in three countries. The study shows that ideas for improvement were expressed infrequently by all the actors, but particularly by consumers, even though the service users' role in developing services has been emphasized in the literature. The different actors provided recurring but also some different improvement ideas. The consumers' typical ideas were general and rather self-evident, whereas the salespeople focused more on improving the service promotion and service process and retailers, in turn, took a broader approach. As the different stakeholders in the delivery chain offer different improvement idea contents for the manufacturing firm and cover service innovation dimensions only partly, manufacturing firms need a holistic strategy for incremental service innovations.

**General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Research on Operations Projects and Services

Contributors: Nenonen, S., Vaittinen, E., Martinsuo, M.

Publication date: Jun 2016

**Host publication information**

Title of host publication: 23rd Innovation and Product Development Management Conference (IPDMC) : Glasgow, U. K. June 12-14, 2016

**Publication series**

Name: Innovation and Product Development Management Conference

ISSN (Print): 1998-7374

Electronic versions:

IPDM2016 Nenonen, Vaittinen & Martinsuo

URLs:

<http://urn.fi/URN:NBN:fi:tty-201708211692>

URLs:

[http://www.eiasm.org/frontoffice/event\\_announcement.asp?event\\_id=1164#4418](http://www.eiasm.org/frontoffice/event_announcement.asp?event_id=1164#4418)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

**Service orientation and innovation in the strategies of manufacturing SMEs**

Manufacturing SMEs have an important role in the supply chains of larger firms. When large firms servitize their business, also SMEs may need to consider their strategies concerning services. Limited research attention has been directed at servitization as a strategic choice of SMEs and its different manifestations in service orientation and innovation. The aim of the paper is to increase understanding on the role of services in the strategies of manufacturing SMEs. The focus is on service orientation and innovation, and identification of differences between component manufacturers and equipment manufacturers. A qualitative, exploratory research strategy is employed in the context of nineteen technology-intensive manufacturing SMEs. The findings from SME managers' interviews show that equipment manufacturers have a stronger service orientation than component manufacturers in terms of share of services, orientation to process-centric services, and service variety. The majority of respondents have experiences with in-house service development primarily, and customer-centric service development took place only in a few companies. Furthermore, companies featured services in their strategies either minimally, reactively or proactively. Equipment manufacturers were more likely to take the proactive approach whereas component manufacturers were more reactive or fully avoided services. This paper offers valuable knowledge about the ways in which technology-intensive SMEs feature service orientation and innovation into their strategies. Besides changes in offerings, capabilities and value networks, servitization can drive changes in the business scope and innovation processes of the manufacturing SMEs.

**General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Research on Operations Projects and Services

Contributors: Martinsuo, M., Väliäho, V.  
Number of pages: 17  
Publication date: Jun 2016

#### Host publication information

Title of host publication: 23rd Innovation and Product Development Management Conference (IPDMC) : 12-14 June, 2016, Glasgow, U.K.

Publisher: EIASM

Electronic versions:

160403\_IPDMC\_ServiceOrientation

URLs:

<http://urn.fi/URN:NBN:fi:tty-201708211693>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Car Type Recognition with Deep Neural Networks

In this paper we study automatic recognition of cars of four types: Bus, Truck, Van and Small car. For this problem we consider two data driven frameworks: a deep neural network and a support vector machine using SIFT features. The accuracy of the methods is validated with a database of over 6500 images, and the resulting prediction accuracy is over 97 %. This clearly exceeds the accuracies of earlier studies that use manually engineered feature extraction pipelines.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Signal Processing, Research group: Vision

Contributors: Huttunen, H., Shokrollahi Yancheshmeh, F., Chen, K.

Pages: 1115-1120

Publication date: Jun 2016

#### Host publication information

Title of host publication: 2016 IEEE Intelligent Vehicles Symposium, IV 2016

Publisher: IEEE

ISBN (Print): 9781509018215

DOIs:

10.1109/IVS.2016.7535529

URLs:

<https://arxiv.org/abs/1602.07125>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Disruptive innovation in ecosystems: Path-creation and institutional barriers

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Innovation and Technology Research, Lappeenranta University of Technology

Contributors: Ritala, P., Aarikka-Stenroos, L.

Number of pages: 16

Pages: 1-16

Publication date: Jun 2016

#### Host publication information

Title of host publication: XXVI ISPIM Conference: Porto, Portugal (2016) Blending Tomorrow's Innovation Vintage. : The International Society for Professional Innovation Management, Jun. 2016

Place of publication: Manchester

Publisher: International Society for Professional Innovation Management ISPIM

ISBN (Print): 978-952-265-929-3

ISBN (Electronic): 978-952-265-929-3

URLs:

<http://search.proquest.com/docview/1803692263?pq-origsite=gscholar>

Source: Bibtex

Source ID: urn:c0dee1d4b4657d55de8d93bf3fad657c

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Electricity Distribution Network Tariffs - Present Practices, Future Challenges and Development Possibilities**

In this paper, we discuss the pricing of electricity distribution. In the paper, the present practices concerning the forming of tariffs are examined. The possible directions and main future challenges of the energy sector can present challenges for the business of Distribution System Operators (DSOs). These change directions and challenges are examined and explained in the paper. The development opportunities from the alternative distribution network tariff structure and implementation possibility point of view are briefly discussed in the paper.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering, Helen Electricity Network Ltd.

Contributors: Lummi, K., Rautiainen, A., Järventausta, P., Heine, P., Lehtinen, J., Hyvärinen, M.

Number of pages: 4

Publication date: Jun 2016

#### **Host publication information**

Title of host publication: CIRED Workshop 2016

ISBN (Electronic): 978-1-78561-202-2

URLs:

[http://www.cired.net/publications/workshop2016/pdfs/CIRED2016\\_0112\\_final.pdf](http://www.cired.net/publications/workshop2016/pdfs/CIRED2016_0112_final.pdf)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **In-band-pumped mode-locked Ho:YAG ceramic laser at 2.1 $\mu\text{m}$**

SESAM mode-locking of a Ho:YAG ceramic laser operating near 2.1  $\mu\text{m}$  is reported achieving a pulse duration of 8 ps and output power as high as 258 mW at a repetition rate of ~83 MHz.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications

Contributors: Wang, Y., Lan, R., Mateos, X., Li, J., Pan, Y., Suomalainen, S., Härkönen, A., Guina, M., Griebner, U., Petrov, V.

Number of pages: 2

Pages: 1-2

Publication date: Jun 2016

#### **Host publication information**

Title of host publication: 2016 Conference on Lasers and Electro-Optics (CLEO)

Publisher: IEEE

ISBN (Electronic): 978-1-943580-11-8

Keywords: ceramics, holmium, laser beams, laser mirrors, laser mode locking, optical pumping, optical saturable absorption, solid lasers, yttrium compounds, SESAM mode-locking, YAG:Ho, in-band-pumped mode-locked Ho:YAG ceramic laser, output power, power 258 mW, pulse duration, time 8 ps, wavelength 2.1  $\mu\text{m}$ , Ceramics, Gas lasers, Laser excitation, Laser mode locking, Power generation, Power lasers, Pump lasers

Source: Bibtex

Source ID: urn:487a5ec4dd0da809c9267dca5fd5b7f4

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Relevance of five generic business ideation approaches vis-a-vis contexts embedded within construction markets**

In general, ideation encompasses the formation of ideas or mental images of things not present to the senses or simply the creation of new ideas. Business ideation is herein perceived to be the core area within future-oriented business management (BM). The main aim of the paper is to assess and advance the relevance of the five generic approaches to business ideation vis-à-vis

firms targeting contexts embedded within construction markets. A typology differentiates between the fitting, value-creating, profit generating, systemizing, and commercializing approaches. It is argued that each approach is, at minimum, highly relevant in the case of business unit (BU) management targeting preferred client investment and procurement behavior within construction markets. Approach 1 involves BUs aiming at fit between clients and their needs as well as units' offerings and operations, respectively. Professional clients couple needs with preferred procurement methods whereas competing BUs are trying to achieve best fit between solutions and client behaviors. This approach calls for research on how to sustain such fit between a BU and clients when changes occur. Approach 2 enables BUs to create value by specifying high-value propositions, producing value to clients, and capturing their fair shares of

produced values. Farsighted clients look for more or novel values for construction investments and, thus, units are collaborating and co-producing values to clients. This approach calls for research on a BU's value co-production with such

clients, value capture, and offerings integration. Approach 3 accommodates BUs that are focusing on generating profits, achieving high-profit levels, and sustaining them. Pioneering clients pursue complex investment aims that can be met only by radical solutions. This approach calls for research on a BU's profit-generating mechanisms related to clients with complex investment needs and radical solutions. Approach 4 facilitates BUs to systemize businesses around core ideas. Sectoral clients have large or complex needs and, in turn, units are satisfying them by engineering systems as wholes and delivering them as parts. This approach calls for research on BUs with systems and clients, multi-dimensional investments, and system engineering as wholes and parts. Approach 5 facilitates BUs to couple ideas with commercializing dimensions such as entrepreneurship, innovation, business development, venturing, or spin-offing. Risk-taking clients prefer to enter high-innovation contracts and, thus, units are offering novel solutions and emerging business cases. This approach calls for research on a BU's entrepreneurial competencies and risk-taking clients, wicked investment needs, and high-innovation contracts. In the same vein, the suggestions are put forth to CIB-related scholars for directing research on along the BM and ideation dimensions and adopting most relevant approaches. Likewise, management in firms and BUs competing in construction markets are encouraged to assess the business case-sensitive relevance of each of Approaches 1-5 and try out those with initial high relevance.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector

Contributors: Huovinen, P.

Number of pages: 12

Pages: 1129-1140

Publication date: 28 May 2016

### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016, May 30 - June 3, 2016, Tampere, Finland : Advancing products and services

Volume: V

Place of publication: Tampere

Publisher: Tampere University of Technology. Department of Civil Engineering

Editor: Achour, N.

ISBN (Print): 978-952-15-3745-5

Keywords: Business ideation, business management, construction markets, literature review

Electronic versions:

CIB WBC16 Pekka Huovinen Final paper (camera-ready) 280316

URLs:

<http://urn.fi/URN:NBN:fi:tty-201611214721>

URLs:

<http://www.wbc16.com/wbc16/welcome.html>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Radical programmes for developing the EU residential building sectors as exemplified by Finland and the Netherlands

The economic recession has hit especially hard the residential building sector in the EU region, e.g., the number of the housing completions has decreased -49% and the total residential output has been squeezed down by -24% between 2007 and 2014 (Euroconstruct, 2015). In turn, the aim of our paper is to suggest a set of radical, novel programmes for developing the national residential building sectors within EU member countries up to 2025. We have applied the framework of strategic niche management (SNM) to the diagnoses of the current portfolios of the innovation, R&D programs in our two member country contexts. In the case of the Northern Finland, the prime example is Hiukkavaara, the largest district to be built in the City of Oulu. Homes will be constructed for 20,000 new residents. Hiukkavaara is a model for climate-conscious design in the northern hemisphere. Energy and materials are conserved, nature is valued and human beings adapt to their environment. One sub-programme involves Future Buildings and Renewable Energy Project. In the case of the Netherlands, the prime example is Energiesprong (Energy Leap), i.e., the innovation programme commissioned by the Dutch Ministry of the Interior. The aim is to make buildings energy-neutral and boost large-scale initiatives. The sub-programmes are targeting homes owned by housing associations, privately owned homes, office buildings, shops and care institutions. This programme is about ensuring new supply by encouraging companies to package a variety of technical sub-solutions, full services and financing options as well as about asking clients to put out tenders and ask for quotes in novel ways, with the government making changes to the rules and the regulations. Experiences on which the Dutch case in this paper focuses are sub-programmes for residential buildings which includes Rapids, All Lights on Green and Our Home Deserves It. Based on the emerging Finnish and Dutch evidence, we are suggesting key elements to be incorporated into future national residential programmes within EU member countries on: (1) radical direction with balanced stakeholder groups, trustworthy advocates, contextual goal-setting and barriers management, (2) radical networking with entrepreneurial roles and causal links, novel expertise, transparent choices and digital platforms and (3) radical learning processes to arrive at better informed markets on user preferences, co-innovating, new rules and regulations, higher performance/price ratios, higher quality, new roles and responsibilities assignments.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector, Hanse University of Applied Sciences, Saxion University of Applied Sciences

Contributors: Oostru, M., Huovinen, P.

Number of pages: 12

Pages: 17-28

Publication date: 28 May 2016

### Host publication information

Title of host publication: Proceedings of CIB World Building Congress 2016, May 30 - June 3, 2016 Tampere, Finland : Creating built environments of new opportunities

Volume: I

Place of publication: Tampere

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Print): 978-952-15-3741-7

ASJC Scopus subject areas: Engineering(all)

Keywords: Hiukkavaara, Energiesprong, innovation programme, residential building sector

Electronic versions:

WBC16 Oostru M and Huovinen P, Radical programmes for developing the EU residential sectors as exemplified by Finland and the Netherlands

URLs:

<http://urn.fi/URN:NBN:fi:tty-201611214720>

URLs:

<http://www.wbc16.com/wbc16/welcome.html>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Life-Cycle Economics of Rentable Prefabricated School Facility Units in Municipal Real Estate Procurement

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Real estate development, Research group: Service Life Engineering of Structures, School of Architecture

Contributors: Vihola, J., Edelman, H.

Number of pages: 12

Pages: 76-87

Publication date: 27 May 2016

### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume V : Advancing Products and Services

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3745-5

Keywords: Prefabricated spatial units, public real estate procurement, school facilities, municipal economics, life-cycle economics

Electronic versions:

Full Paper

URLs:

<http://urn.fi/URN:NBN:fi:tty-201606224311>

URLs:

<http://www.wbc16.com/wbc16/welcome.html> (CIB World Building Congress 2016 : Volume V Advancing Products and Services)

[https://tutcris.tut.fi/admin/files/6334504/WBC16\\_vihola.pdf](https://tutcris.tut.fi/admin/files/6334504/WBC16_vihola.pdf) (CIB World Building Congress 2016 : Volume V Advancing Products and Services)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Durability study on high speed water hydraulic miniature on/off-valve

### General information

Publication status: Published



MoE publication type: A4 Article in a conference publication  
Organisations: Department of Intelligent Hydraulics and Automation, Research group: Digital hydraulics  
Contributors: Paloniitty, M.  
Number of pages: 11  
Pages: 201-211  
Publication date: 24 May 2016

#### Host publication information

Title of host publication: DFP16, Proceedings of the eighth workshop on digital fluid power, May 24-25, 2016, Tampere, Finland  
Place of publication: Tampere  
ISBN (Print): 978-952-15-3755-4  
ISBN (Electronic): 978-952-15-3756-1, 978-952-15-3757-8  
URLs:  
<http://urn.fi/URN:ISBN:978-952-15-3757-8>  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### A Variable Battery Supply DC-DC Buck Converter Designed for 45nm-CMOS Technology

In this paper, a buck DC-DC converter is presented that is capable of operation under variable input battery voltage ranging from 3.5V to 6V. The proposed converter is based on a new design technique using an adaptive biasing circuit for cascode power stage. The biasing circuit changes its configuration when the battery voltage drops down to 4.5V. The converter is implemented in 45-nm CMOS technology; it was simulated and its operation was verified at an output power of 200mW where it achieves a maximum power conversion efficiency of 81% for an output voltage of 1.25V.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Electronics and Communications Engineering, Research group: RF Integrated Circuits, Univ Alberta, University of Alberta, Tampere Univ Technol, Tampere University of Technology  
Contributors: Fouladi, A., Järvenhaara, J., Filanovsky, I. M., Tchamov, N. T.  
Publication date: 15 May 2016

#### Host publication information

Title of host publication: 2016 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), Vancouver, May 15-18, 2016.  
ISBN (Electronic): 978-1-4673-8721-7  
DOIs:  
10.1109/CCECE.2016.7726839  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### On Moderate Inversion/Saturation Regions As Approximations to "Reconciliation" Model

The paper proposes analytical definitions of moderate inversion and moderate saturation. These definitions are introduced considering two different series expansions for the function  $\ln 2(x)$ . The expansions are "matched": the upper limit for convergence of the first series and the lower limit for convergence of the second series define the border and transition from weak to moderate inversion/saturation. The moderate inversion/saturation corresponds to approximation of the function  $\ln 2(x)$  by a modified sum of two first terms of the second series. Then, the condition of inversion/saturation is defined by dominance of one term with respect to another. The condition of moderate inversion/saturation is a necessary step in transition from weak to strong inversion/saturation. The introduced definitions correspond to MOS transistor operation physics and eliminate discontinuity in this transition.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Electronics and Communications Engineering, Research group: RF Integrated Circuits, Univ Alberta, University of Alberta  
Contributors: Filanovsky, I., Järvenhaara, J., Tchamov, N.  
Publication date: 15 May 2016

#### Host publication information

Title of host publication: 2016 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), Vancouver, May 15-18, 2016  
Publisher: IEEE  
ISBN (Electronic): 978-1-4673-8721-7  
DOIs:

10.1109/CCECE.2016.7726696

### **Bibliographical note**

JUFOID=73287

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Optimal operation of a QCS scanner in a paper machine based on the information of QCS and WIS measurements**

The scanner is a measuring device which travels over the running paper web in the paper machine. The device simply travels back and forth despite of the stability of the paper making process. However, the back and forth policy is not necessarily the optimal one when the best control performance is required. This paper introduces an optimal operation method for QCS scanner based on the information gathered from both QCS and WIS devices. The optimal operation is based on the optimal path finding algorithm which predicts web quality uncertainties several time steps ahead. The uncertainty estimation is based on the Kalman filter approach which combines the current measurements (QCS and WIS) and the previous estimates. It was noticed that the regular zig-zag scanning is an optimal solution in several cases however the irregular scanning provides more information especially in the highly unstable situations. The developed method could be utilized in scanner control and it would not require major modification to the current systems.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Automation Science and Engineering, Research area: Dynamic Systems, Research area: Measurement Technology and Process Control

Contributors: Raunio, J., Ritala, R.

Number of pages: 11

Pages: 1-11

Publication date: 14 May 2016

### **Host publication information**

Title of host publication: PaperCon 2016 Conference Proceedings -TAPPI

Place of publication: Cincinnati, USA

Publisher: TAPPI

ISBN (Print): 9781510818873

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Strength increase below an old test embankment in Finland**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Foundation Structures

Contributors: D'Ignazio, M., Länsivaara, T.

Pages: 357-366

Publication date: May 2016

### **Host publication information**

Title of host publication: The 17th Nordic Geotechnical Meeting : Conference proceedings

Place of publication: Reykjavik

Publisher: Icelandic Geotechnical Society

ISBN (Electronic): 978-9935-24-002-6

URLs:

<http://britishgeotech.org/the-17th-nordic-geotechnical-meeting/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Preliminary results from a study aiming to improve ground investigation data**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Foundation Structures, Research area: Infrastructure Construction

Contributors: Di Buo, B., D'Ignazio, M., Selänpää, J., Länsivaara, T.

Number of pages: 11

Pages: 187-197

Publication date: May 2016

### Host publication information

Title of host publication: Proceedings of the 17th Nordic Geotechnical Meeting : Challenges in Nordic Geotechnic 25th-28th of May

Place of publication: Reykjavik

Publisher: Icelandic Geotechnical Society

ISBN (Electronic): 978-9935-24-002-6

URLs:

[http://www.ngm2016.com/uploads/2/1/7/9/21790806/022-072-ngm\\_2016\\_-\\_preliminary\\_results\\_from\\_a\\_study\\_aiming\\_to\\_improve\\_ground\\_investigation\\_data\\_dibuo\\_d%E2%80%99ignazio\\_sel%C3%A4np%C3%A4%C3%A4\\_l%C3%A4nsivaara.pdf](http://www.ngm2016.com/uploads/2/1/7/9/21790806/022-072-ngm_2016_-_preliminary_results_from_a_study_aiming_to_improve_ground_investigation_data_dibuo_d%E2%80%99ignazio_sel%C3%A4np%C3%A4%C3%A4_l%C3%A4nsivaara.pdf)

URLs:

<http://britishgeotech.org/the-17th-nordic-geotechnical-meeting/>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### The effect of climate change on the amount of wind driven rain on concrete facades

Private and public buildings built of concrete make up 34% of the whole building stock in Finland, of which almost 40% is now 30-50 years old. The financial and functional impact on Finnish society of this aged building stock is critical because one third of the country's population lives in these apartment blocks. There is a rising national concern on increasing maintenance needs of Finnish building stock. It has been concluded that new conceptual approaches to tackle the problem are acutely needed. The main reasons for facade degradation in the Finnish climate are freeze-thaw weathering of concrete and corrosion of reinforcement induced by carbonation of the surrounding concrete. A common denominator in every mechanism is water in varying forms. It can either work as a passage for harmful substances, e.g. chlorides, cause damage by its phase changes (freeze-thaw) or cause dissolution of substances in concrete. Two recent projects conducted by Finnish Meteorological Institute and Tampere University of Technology, have shown that future climate conditions in Finland are likely to get worse in terms of durability of structures exposed to climate. Precipitation during the winter season is going to increase while the form of precipitation is going to be increasingly water and sleet. At the same time, the conditions for drying are going to get worse. Thus, the deterioration rate of structures will accelerate in the most of Finland if maintenance and protection actions are neglected. To simulate the effect of changing climate conditions, it has been studied how the amount of wind-driven rain (WDR) on facades may change in future climate based on a greenhouse gas scenario. The study was conducted by comparing typical Finnish suburban concrete block build in 1970's in two different locations (coastal area and inland) at current climate and in 2050 and 2100. Based on the study the amount of WDR will increase more in coastal areas than in inland and will be more focused on south and south-west directions. The total increase in WDR will be approx. 15%, while the greatest increase (50%) will be faced by the westward facades in coastal area.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, Tampere University of Technology

Contributors: Pakkala, T., Lemberg, A., Lahdensivu, J.

Number of pages: 13

Pages: 153-165

Publication date: May 2016

### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016 : Vol 2 : Environmental opportunities and challenges, Constructing commitment and acknowledging human experiences

Volume: 2

Place of publication: Tampere

Publisher: Tampere University of Technology. Department of Civil Engineering

Editors: Prins, M., Wamelink, H., Giddings, B., Ku, K., Feenstra, M.

ISBN (Print): 978-952-15-3742-4

ASJC Scopus subject areas: Civil and Structural Engineering

Keywords: Climate change, Wind-driven rain, Concrete, Modelling

URLs:

[https://tutcris.tut.fi/portal/files/6186797/WBC16\\_Vol\\_2.pdf](https://tutcris.tut.fi/portal/files/6186797/WBC16_Vol_2.pdf)

URLs:

<http://www.wbc16.com/wbc16.html>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Enhancing the acceptance of advanced services among users of complex systems

**Purpose:** In order to succeed in servitization, manufacturing firms need to understand the mechanisms through which their customers accept advanced services. This research explores the customers' readiness towards more advanced services.

The goal is increased knowledge on the aspects that manufacturers need to consider when bringing advanced services into market and ways to enhance the customer acceptance of these services.

**Design/methodology/approach:** A qualitative case study design is used, to analyse readiness for advanced services and service acceptance in a manufacturer's three customer firms. Interview data were collected among 14 persons at the different customer sites and were content analysed.

**Findings:** The results show that customers accustomed to purchasing basic services or implementing them in-house may not yet be ready to purchase advanced services from manufacturers. Customers are uncertain about the benefits and the complete costs of the service. Manufacturers can enhance the customers' acceptance of advanced services by certain activities within the organisation and in relation to the customers e.g. by training service employees and educating the customers.

**Originality/value:** The results offer new knowledge on customer service acceptance in a business-to-business context and, thereby, complement previous studies on the supplier perspective to servitization and service acceptance in consumer business. The contributions help manufacturers to identify practices for enhancing the customer firms' readiness and acceptance of advanced services.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Center for Research on Operations Projects and Services

Contributors: Vaittinen, E., Martinsuo, M., Nenonen, S.

Number of pages: 9

Pages: 162-170

Publication date: May 2016

### Host publication information

Title of host publication: Servitization: Shift, Transform, Grow : Proceedings of the Spring Servitization Conference, 16-17 May 2016 (SSC2016)

Editors: Baines, T., Harrison, D., Zolkiewski, J.

ISBN (Print): 978-185-44-9403-0

Electronic versions:

SSC, Vaittinen, Martinsuo & Nenonen

URLs:

<http://urn.fi/URN:NBN:fi:tty-201708171686>

URLs:

<http://www.aston.ac.uk/aston-business-school/research/events/ssc2016/>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Feasibility characterization of cryptographic primitives for constrained (wearable) IoT devices

The Internet of Things (IoT) employs smart devices as its building blocks for developing a ubiquitous communication framework. It thus supports a wide variety of application domains, including public safety, healthcare, education, and public transportation. While offering a novel communication paradigm, IoT finds its requirements closely connected to the security issues. The role of security following the fact that a new type of devices known as wearables constitute an emerging area. This paper delivers an applicability study of the state-of-the-art cryptographic primitives for wearable IoT devices, including the pairing-based cryptography. Pairing-based schemes are well-recognized as fundamental enablers for many advanced cryptographic applications, such as privacy protection and identity-based encryption. To deliver a comprehensive view on the computational power of modern wearable devices (smart phones, watches, and embedded devices), we perform an evaluation of a variety of them utilizing bilinear pairing for real-time communication. In order to deliver a complete picture, the obtained bilinear pairing results are complemented with performance figures for classical cryptography (such as block ciphers, digital signatures, and hash functions). Our findings show that wearable devices of today have the needed potential to efficiently operate with cryptographic primitives in real time. Therefore, we believe that the data provided during this research would shed light on what devices are more suitable for certain cryptographic operations.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Emerging Technologies for Nano-Bio-Info-Cogno

Contributors: Ometov, A., Masek, P., Malina, L., Florea, R., Hosek, J., Andreev, S., Hajny, J., Niutanen, J., Koucheryavy, Y.

Publication date: 19 Apr 2016

### Host publication information

Title of host publication: 2016 IEEE International Conference on Pervasive Computing and Communication Workshops, PerCom Workshops 2016

Publisher: IEEE

ISBN (Print): 9781509019410

ASJC Scopus subject areas: Computer Science Applications, Computer Networks and Communications, Human-Computer Interaction

Keywords: Bilinear Pairing, Cryptography, Group Signatures, IoT, Performance evaluation, Wearables

DOIs:

10.1109/PERCOMW.2016.7457161

### Bibliographical note

INT=elt,"Florea, Roman"

EXT="Niutanen, Jussi"

Source: Scopus

Source ID: 84966546696

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Sisäympäristön laadun ja terveellisuuden arviointi energiaparannuskohteissa

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Concrete and Bridge Structures, Research area: Structural Engineering, Department of Civil Engineering, Research group: Building Physics, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth

Contributors: Mari, T., Leivo, V., Pekkonen, M., Aaltonen, A., Kiviste, M., Haverinen-Shaughnessy, U.

Number of pages: 6

Pages: 13-18

Publication date: 16 Mar 2016

### Host publication information

Title of host publication: Sisäilmastoseminaari 2016, Sisäilmayhdistys raportti 34

Publisher: SIY SISÄILMATIETO OY

ISBN (Print): 978-952-5236-44-6

URLs:

[http://sisailmayhdistys.omaverkkokauppa.fi/epages/sisailmayhdistys.sf/fi\\_FI/?ObjectPath=/Shops/2015081803/Products/S/E16](http://sisailmayhdistys.omaverkkokauppa.fi/epages/sisailmayhdistys.sf/fi_FI/?ObjectPath=/Shops/2015081803/Products/S/E16)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## InGaAs-QW VECSEL emitting >1.300-nm via intracavity Raman conversion

We report intracavity Raman conversion of a long-wavelength InGaAs-QW VECSEL to ~1320 nm, the longest wavelength yet achieved by a VECSEL-pumped Raman laser. The setup consisted of a VECSEL capable of emitting >17W at 1180nm and tunable from 1141-1203nm and a 30-mm-long KGd(WO<sub>4</sub>)<sub>2</sub> (KGW) Raman crystal in a coupled-cavity Raman resonator. The Raman cavity was separated from the VECSEL resonator by a tilted dichroic mirror, which steers the Raman beam to an output coupler external to the VECSEL. The spectral emission of the VECSEL, and consequently of the Raman laser, was set by a 4-mm-thick quartz birefringent filter in the VECSEL cavity. The KGW Raman laser was capable of emitting 2.5W at 1315 nm, with M<sup>2</sup>~2.7 and >4% diode-to-Stokes conversion efficiency. The Raman laser emission was tunable from 1295-1340 nm, limited by the free spectral range of the birefringent filter. Spectral broadening of the fundamental emission was observed during Raman conversion. At the maximum Raman laser output power, the total linewidth of the VECSEL spectrum was ~0.7nm FWHM. As a consequence, the Raman laser emission was also relatively broad (~0.9nm FWHM). Narrow (<0.2nm FWHM) Raman emission was obtained by inserting an additional 100 μm etalon within the VECSEL cavity. With this configuration the fundamental intracavity power clamped at its value at the Raman threshold, suggesting an enhanced effective Raman gain, but the maximum output power of the Raman laser was 1.8 W.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications, University of Strathclyde

Contributors: Parrotta, D., Casula, R., Penttinen, J., Leinonen, T., Kemp, A., Guina, M., Hastie, J.

Publication date: 12 Mar 2016

### Host publication information

Title of host publication: Vertical External Cavity Surface Emitting Lasers (VECSELs) VI

ISBN (Print): 9781628419696

### Publication series

Name: Proceedings of SPIE

ISSN (Print): 0277-786X

DOIs:

10.1117/12.2217593

### Bibliographical note

JUF0ID=71479

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Difference frequency modulation of multi-section dual-mode lasers with nanoscale surface gratings

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications,

Research group: Nanophotonics, Facilities and Infrastructure

Contributors: Uusitalo, T., Virtanen, H., Viheriälä, J., Salmi, J., Aho, A. T., Dumitrescu, M.

Number of pages: 9

Publication date: 7 Mar 2016

### Host publication information

Title of host publication: SPIE Proceedings : Novel In-Plane Semiconductor Lasers XV

Volume: 9767

Publisher: SPIE

Editors: Belyanin, A. A., Smowton, P. M.

Article number: 97670S

### Publication series

Name: Proceedings of SPIE

ISSN (Electronic): 0277-786X

Keywords: Frequency modulation, lasers, Nanotechnology, Modulation, Nanoimprint lithography, Quantum dots, terahertz radiation, ultraviolet radiation, distributed feedback laser diodes

DOIs:

10.1117/12.2213888

### Bibliographical note

INT=orc,"Aho, Antti T."

JUF0ID=71479

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Random Value Impulse Noise Removal Based on Most Similar Neighbors

A novel filter based on four most similar neighbors (MSN) is proposed in this paper which considers all the pixels of the sliding window except the central pixel after taking the first order absolute differences from the central pixel. The proposed filter is composed of two steps: noise detection followed by filtering. In noise detection, first order absolute differences are calculated and sorted in ascending order. Clusters of equal sizes are formed based on most similar pixels and then fuzzy rules are applied to detect the noise present in the current pixel. Threshold parameters are set adaptively. In filtering phase, median based fuzzy filter is used to restore the corrupted pixels. Experimental results show that the proposed filter outperforms several state-of-the-art filters for random value impulse noise removal in an image.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, International Islamic University Islamabad

Contributors: Habib, M., Rasheed, S., Hussain, A., Ali, M.

Number of pages: 5

Pages: 329-333

Publication date: 26 Feb 2016

### Host publication information

Title of host publication: 2015 13th International Conference on Frontiers of Information Technology (FIT)

Publisher: IEEE

ISBN (Print): 9781467396660

ASJC Scopus subject areas: Health Informatics, Computer Science Applications, Signal Processing

Keywords: fuzzy logic, Image processing, impulse noise, noise removal

DOIs:

10.1109/FIT.2015.64

#### **Bibliographical note**

INT=elt,"Ali, Mubashir"

Source: Scopus

Source ID: 84964689604

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Lean manufacturing methods in simulation literature: Review and association analysis**

The lean manufacturing philosophy includes several methods that aim to remove waste from production. This paper studies lean manufacturing methods and how simulation is used to consider them. In order to do this, it reviews papers that study simulation together with lean methods. The papers that are reviewed are categorized according to the lean methods used and result types obtained. Analysis is performed in order to gain knowledge about the volumes of occurrence of different methods and result types. Typical methods in the papers are different types of value stream mapping and work-in-process models. An exploratory analysis is performed to reveal the relationships between the methods and result types. This is done using association analysis. It reveals the methods that are commonly studied together in the literature. The paper also lists research areas that are not considered in the literature. These areas are often related to the analysis of variation.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mechanical Engineering and Industrial Systems, Research area: Manufacturing and Automation, Aalto University, Department of Engineering Design and Production

Contributors: Tokola, H., Niemi, E., Väistö, V.

Number of pages: 10

Pages: 2239-2248

Publication date: 16 Feb 2016

#### **Host publication information**

Title of host publication: 2015 Winter Simulation Conference (WSC)

ISBN (Print): 978-1-4673-9743-8

ASJC Scopus subject areas: Software, Modelling and Simulation, Computer Science Applications

DOIs:

10.1109/WSC.2015.7408336

#### **Bibliographical note**

EXT="Niemi, Esko"

Source: Scopus

Source ID: 85032069323

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Optical amplifiers and lasers based on tapered fiber geometry for power and energy scaling with low signal distortion**

We report theoretical and experimental study of tapered double-clad fibers (T-DCF) to be implemented as a gain media in a fiber lasers and amplifiers. We have considered most important properties and features of T-DCF. Various amplifiers and lasers using ytterbium T-DCF are demonstrated.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Ultrafast and intense lasers, Institute of Radio Engineering and Electronics, Russian Academy of Sciences (IRE RAS)

Contributors: Filippov, V., Chamorovskii, Y. K., Golant, K. M., Vorotynskii, A., Okhotnikov, O. G.

Number of pages: 11

Publication date: Feb 2016

#### **Host publication information**

Title of host publication: Proceedings of SPIE : Fiber Lasers XIII: Technology, Systems, and Applications

Volume: 9728

Publisher: SPIE

Editor: Ballato, J.

Article number: 97280V-1

#### **Publication series**

Name: SPIE conference proceedings  
Publisher: SPIE  
ISSN (Print): 0277-786X  
ISSN (Electronic): 1996-756X  
DOIs:  
10.1117/12.2218051

### Bibliographical note

JUFOID=71479

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### A 1.5-W frequency doubled semiconductor disk laser tunable over 40 nm at around 745 nm

1.5 W of output power was obtained in the challenging wavelength range between 700 and 800 nm by frequency doubling a wafer-fused 1.49- $\mu\text{m}$  semiconductor disk laser pumped with 980-nm diodes. A bismuth borate crystal was used for doubling the frequency. A total optical-to-optical efficiency of 8.3 % was achieved. The laser was tunable from 720 to 764 nm with an intracavity birefringent plate. The beam quality parameter M2 remained below 1.5 at all power levels. The laser is attractive for biomedical applications such as photodynamic therapy that benefit from the low absorption of light in tissue in this spectral range.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Ultrafast and intense lasers, Research group: Semiconductor Technology and Applications, Optoelectronics Research Centre, Tampere University of Technology, Ecole Polytech Fed Lausanne, Ecole Polytechnique Federale de Lausanne, Lab Phys Nanostruct

Contributors: Saarinen, E. J., Lyytikäinen, J., Ranta, S., Rantamäki, A., Saarela, A., Sirbu, A., Iakovlev, V., Kapon, E., Okhotnikov, O. G.

Number of pages: 8

Publication date: 2016

### Host publication information

Title of host publication: Proceedings of SPIE : Vertical External Cavity Surface Emitting Lasers (VECSELs) VI

Volume: 9734

Publisher: SPIE

Article number: 97340P-8

### Publication series

Name: Spie conference proceedings

Publisher: SPIE

ISSN (Electronic): 0277-786X

DOIs:

10.1117/12.2209384

### Bibliographical note

INT=orc,"Saarela, Antti"

JUFOID=71479

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### On Detecting the Shape of an Unknown Object in an Electric Field

The problem discussed in this paper is detecting the shape of an unknown object in a 2-dimensional static electric field. For simplicity, the problem is defined in a partially rectangular domain, where on a part of the boundary the potential and/or its normal derivative are known. On the other part of the boundary the boundary curve is unknown, and this curve is to be determined. The unknown part of the boundary curve describes the shape of the unknown object.

The problem is defined in the complex plane by an analytic function  $w=f(z) = u(x,y)+iv(x,y)$  with the potential  $u$  as its real part. Then the inverse function is given as  $f^{-1}(w) = x(u,v)+iy(u,v)$ , where the functions  $x$  and  $y$  are harmonic in a rectangle with an unknown boundary condition on one boundary. The alternating-field technique is used to solve the unknown boundary condition.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mathematics, Research group: MAT Mathematical and semantic modelling, Research group: MAT Intelligent Information Systems Laboratory

Contributors: Humaloja, J., Hämäläinen, T., Pohjolainen, S.

Publication date: 2016



### Host publication information

Title of host publication: Progress in Industrial Mathematics at ECMI 2014  
Publisher: Springer International Publishing  
Editors: Russo, G., Capasso, V., Nicosia, G., Romano, V.  
ISBN (Print): 978-3-319-23412-0  
ISBN (Electronic): 978-3-319-23413-7

### Publication series

Name: Mathematics in Industry  
Publisher: Springer-Verlag  
Volume: 22  
ISSN (Electronic): 1612-3956  
Keywords: free boundary problem, industrial mathematics  
DOIs:  
10.1007/978-3-319-23413-7  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201606014205>. No embargo end date input  
<https://www.springer.com/gp/book/9783319234120>

### Bibliographical note

Embargo avoinna, koska ei vielä julkaistu (Due May 3, 2017)  
HO / 2.5.2016  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Multicarrier modulation for HF communications

High-frequency (HF) communications can be flexibly realized using multicarrier modulation techniques. This paper compares the performance of three widely utilized MCM techniques, namely, orthogonal frequency-division multiplexing (OFDM), filter bank multicarrier/offset-QAM (FBMC/OQAM), and filtered multitone (FMT) in HF communications. The performance of these systems is simulated using commonly adopted HF-channel models. It is shown that the simulated uncoded bit-error rate of OFDM is slightly better than that of FBMC/OQAM and FMT. However, with pilot based channel estimation FMT outperforms FBMC/OQAM and OFDM systems in achievable coded frame error rate in case of selective channel models.

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Kyynel Oy  
Contributors: Yli-Kaakinen, J., Renfors, M., Tuomivaara, H.  
Number of pages: 7  
Publication date: 2016

### Host publication information

Title of host publication: 2016 International Conference on Military Communications and Information Systems (ICMCIS)  
Publisher: IEEE  
ISBN (Print): 9781509017775  
DOIs:  
10.1109/ICMCIS.2016.7496542  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Short range HF radio channel measurements: Search for one path channels

High frequency (HF) radio channel is diverse since it could be a single path channel or a multipath channel. However, there is lack of information about what is the ratio between these. Herein, results from a measurement campaign in Finland for ground wave and near vertical incidence skywave (NVIS) paths are reported. It was observed that one path channels are rather widely available and in ground waves they dominate. This means that channels for high modulation orders (high data rate HF) are available and should be searched for during the link establishment process. Unfortunately, the current link establishment processes do not support that such that maybe it is time for improvements. Another observation was that if channels are available at all, then usually there are multiple channels available. This means that recently introduced wideband (up to 24 kHz) and multiband (several 3 kHz bands) HF communications have room.

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Oulun Yliopisto/CWC, Kyynel Oy

Contributors: Saarnisaari, H., Hovinen, V., Tuomivaara, H., Yli-Kaakinen, J.  
Number of pages: 6  
Publication date: 2016

#### Host publication information

Title of host publication: 2016 International Conference on Military Communications and Information Systems (ICMCIS)  
ISBN (Electronic): 9781509017775  
DOIs:  
10.1109/ICMCIS.2016.7496559  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### DIC measurements of the human heart during cardiopulmonary bypass surgery

Image-based measurements of the deformation of the human heart can be very useful to the surgeon, when assessing the condition and functioning of the patient's heart. Digital image correlation can provide fast and accurate information about the deformation and motion of the surface of the heart. The deformation measurements can be visualized with colors allowing easy interpretation of the results, which makes this technique even more suitable for use in the operating room. Digital image correlation, however, requires either a natural or an artificial surface pattern with high contrast. The surface of the heart is wet, smooth, and has only a minimal contrast pattern, which cannot easily be improved with artificial markers. This preliminary feasibility study, however, shows that despite the practical and theoretical problems, DIC can provide useful data on the deformation of the human heart during cardiopulmonary bypass surgery. The results show that the natural patterns of the right atrium and ventricle are sufficient for DIC analysis, but significantly better results could be obtained with higher contrast artificial patterns.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Materials Science, Research group: Materials Characterization, Universitätsklinikum Gießen und Marburg GmbH, LaVision GmbH  
Contributors: Hokka, M., Mirow, N., Nagel, H., Vogt, S., Kuokkala, V.  
Number of pages: 9  
Pages: 51-59  
Publication date: 2016

#### Host publication information

Title of host publication: Conference Proceedings of the Society for Experimental Mechanics Series  
Volume: 6  
Publisher: Springer New York LLC  
ISBN (Print): 9783319214542  
ASJC Scopus subject areas: Engineering(all), Computational Mechanics, Mechanical Engineering  
Keywords: Digital Image Correlation, Human heart, In-vivo measurements, Natural pattern  
DOIs:  
10.1007/978-3-319-21455-9\_6

#### Bibliographical note

JUF0ID=72540  
Source: Scopus  
Source ID: 84952003607  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Quantitative Estimation of Long-living Fluorescent Molecules from Temporal Fluorescence Intensity Data Corrupted by Nonzero-mean Noise

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Signal Processing, Research group: Laboratory of Biosystem Dynamics-LBD, Research area: Information Technology for Biology and Health, Research area: Intelligence in Machines, Research group: MMDM, Research area: Signal and Information Processing  
Contributors: Startceva, S., Chandraseelan, J. G., Visa, A., Ribeiro, A. S.  
Pages: 17-24  
Publication date: 2016

#### Host publication information

Title of host publication: BIOSIGNALS 2016 - 9th International Conference on Bio-Inspired Systems and Signal Processing, Proceedings; Part of 9th International Joint Conference on Biomedical Engineering Systems and Technologies, BIOSTEC 2016

Publisher: SCITEPRESS

ISBN (Print): 9789897581700

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Different approaches of the PLM maturity concept and their use domains –analysis of the state of the art**

Product lifecycle management (PLM) implementation and adoption involves extensive changes in both intra-and inter-organizational practices. Various maturity approaches, for instance based on CMM (Capability maturity modeling) principles, can be used to make the implementation of PLM a better approachable and a more carefully planned and coordinated process. However, there are a number of different types of current approaches which can be thought to fall under the concept of PLM maturity. The aim of this paper is to investigate, analyze and categorize the various existing PLM maturity approaches to get an organized picture of the models and their background presumptions, as well as their potential use domains, and to facilitate their proper use to better implement PLM in different industry contexts.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Information Management and Logistics, Research group: Novi, Lappeenranta University of Technology

Contributors: Kärkkäinen, H., Silventoinen, A.

Number of pages: 14

Pages: 89-102

Publication date: 2016

#### **Host publication information**

Title of host publication: Product Lifecycle Management in the Era of Internet of Things : 12th IFIP WG 5.1 International Conference, PLM 2015, Doha, Qatar, October 19-21, 2015, Revised Selected Papers

Publisher: Springer New York LLC

ISBN (Print): 978-3-319-33110-2

#### **Publication series**

Name: IFIP Advances in Information and Communication Technology

Volume: 467

ISSN (Print): 1868-4238

ASJC Scopus subject areas: Information Systems and Management

Keywords: Comparison, Maturity approaches, Maturity models, Product lifecycle management, State-of-the-Art

DOIs:

10.1007/978-3-319-33111-9\_9

Source: Scopus

Source ID: 84964801199

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Analysis of Real Mobility Records in Urban and Suburban Environments**

The long-term motion of vehicles and people is of great interest for many sectors of our society, such as urban planning, traffic forecasting, medicine, retail economy and public transport.

This paper analyzes the parameters of multiple mobility data sets obtained from real-field measurement campaigns. The mobility records show how the target vehicles use the street network in different geographical areas (old city center, suburban areas and highways). The records are obtained from Global Navigation Satellite System receivers mounted on the targets.

This study is useful for smart city scenarios for assessing the feasibility and the performance of metropolitan transport networks.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Wireless Communications and Positioning (WICO), Ministry of National Education. University Politehnica of Bucharest

Contributors: Alexandru, R. C., Lohan, E.

Pages: 0688-0692

Publication date: 2016

#### **Host publication information**

Title of host publication: 26TH DAAAM International Symposium on Intelligent Manufacturing and Automation  
Publisher: DAAAM International  
ISBN (Print): 978-3-902734-07-5  
DOIs:

10.2507/26th.daaam.proceedings.094

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Extending Professional Fields. Architectural Research and Regional Development**

In this article, architectural research work is studied as an effective operations model in regional innovation networks of building clusters. The study focuses on the projects of an academic research team working at the University Centre of Seinäjoki, as well as on the innovation environment of the surrounding South Ostrobothnian region in Western Finland. There is no actual university in the region, but the University Centre hosts some twenty professors and their research teams from six Finnish universities. The head of the subject team is also the author of this article. Because of this, the method applied in the article is a reflective action research approach.

The actions and impacts of the research work will be analysed through three case projects. The first case is the development of the large railway station area that will form a new 20-hectare multifunctional part of the city centre of Seinäjoki. The project has strong linkages to the economic policies of the city. The second case is related to the boom in new timber construction, which has been going on in Central Europe and Scandinavia for some time, but not so strongly in the subject region of this study. The aim of the project was to train small and medium-sized building cluster firms to take advantage of the emerging business potential in timber construction. The third case is closely related to the real speciality of the region. The city of Seinäjoki is home to one of the most complete building groups of architect Alvar Aalto, the famous civic centre that consists of the town hall, library, theatre, office building, church and the parish centre. At the moment there is a very demanding renovation project going on, which was also the main subject of the recent research and development project.

The descriptions of the projects are meant to illustrate the operational field of the research team, but the main focus of the article is to analyse the innovation environment that the researchers join as players among others, thus deviating from the more conventional role of architectural professionals.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: School of Architecture, Research group: Urban Laboratory

Contributors: Hynynen, A.

Number of pages: 12

Pages: 372-383

Publication date: 2016

#### **Host publication information**

Title of host publication: Proceedings of the CIB World Building Congress 2016. : Volume I - Creating built environments of new opportunities

Volume: I

Publisher: Tampere University of Technology. Department of Civil Engineering

Editors: Kähkönen, K., Keinänen, M.

ISBN (Print): 978-952-15-3741-7

URLs:

[https://tutcris.tut.fi/portal/files/6186667/WBC16\\_Vol\\_1.pdf](https://tutcris.tut.fi/portal/files/6186667/WBC16_Vol_1.pdf)

URLs:

<http://www.wbc16.com/wbc16/welcome.html>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Ventilation rates and CO2-levels before and after energy retrofit in Finnish apartment buildings**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Concrete and Bridge Structures, Research area: Structural Engineering, Department of Civil Engineering, Research group: Building Physics, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth

Contributors: Leivo, V., Aaltonen, A., Turunen, M., Du, L., Kiviste, M., Haverinen-Shaughnessy, U.

Publication date: 2016

#### **Host publication information**

Title of host publication: CLIMA 2016 - Proceedings of the 12th REHVA World Congress. Aalborg. Aalborg University.  
Department of Civil Engineering. : Volume 1. Building Retrofit  
Volume: 1

Place of publication: Aalborg  
Publisher: Aalborg university, Department of Civil Engineering  
Editor: Kvols Heiselberg, P.

Article number: 192 (in vol 1)  
ISBN (Electronic): 87-91606-26-8  
URLs:

<http://vbn.aau.dk/en/activities/clima-2016--12th-rehva-world-congress%2843019fd3-70a7-4c5c-9176-825add5913f%29.html>

URLs:

[http://vbn.aau.dk/files/233707103/paper\\_192.pdf](http://vbn.aau.dk/files/233707103/paper_192.pdf)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## **Building energy retrofits, occupant health and wellbeing**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Building Physics, Department of Civil Engineering, Research area: Structural Engineering , Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth

Contributors: Haverinen-Shaughnessy, U., Pekkonen, M., Turunen, M., Aaltonen, A., Leivo, V.

Number of pages: 9

Pages: 679-687

Publication date: 2016

### **Host publication information**

Title of host publication: CIB World Building Congress 2016 Proceedings : Volume 2 Environmental Opportunities and challenges - Constructing commitment and acknowledging human experiences

Volume: 2

Publisher: Tampere University of Technology. Department of Civil Engineering

Editors: Prins, M., Wamelink, H., Giddings, B., Ku, K., Feenstra, M.

ISBN (Electronic): 978-952-15-3742-4

URLs:

[https://tutcris.tut.fi/portal/files/6186797/WBC16\\_Vol\\_2.pdf](https://tutcris.tut.fi/portal/files/6186797/WBC16_Vol_2.pdf)

URLs:

<http://www.wbc16.com/wbc16.html>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## **Building Codes and Demand Response of Energy Use**

Buildings are an essential part of the wider energy system. A significant share of electricity consumption occurs in buildings. Traditionally buildings have been places where electricity is consumed. Now they have a growing role also as a location where renewable energy production, such as solar power, occurs.

Demand response means the voluntary actions that are taken on the customer side as a response to something on the demand side. In practice, demand response can involve, for example, reducing the energy consumption during the peak times of the larger energy system or shifting the timing of the building's energy consumption by synchronizing it with local renewable energy production's profile inside the building. The building codes of Finland direct the designers' energy-related solutions both in new construction and licenced renovations.

In this conceptual paper the literature related to demand response and regulation is reviewed, and it is discussed what kind of a role the building codes could have in advancing the buildings' preconditions for demand response. Demand response is currently brought out in EU directives in the regulation with relation to network operators. However, preparedness for demand response could also be advanced by giving more attention to the timing of power use in the building codes.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES, Research group: Real estate development, Department of Electrical Engineering, Research area: Power engineering, Lappeenranta University of Technology, Tampere University of Applied Science

Contributors: Sorri, J., Heljo, J., Järventausta, P., Honkapuro, S., Harsia, P.

Number of pages: 14  
Pages: 8-21  
Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume IV : Understanding Impacts and Functioning of Different Solutions

Volume: 4

Publisher: Tampere University of Technology. Department of Civil Engineering

Editors: Nenonen, S., Junnonen, J.

ISBN (Electronic): 978-952-15-3744-8

Keywords: building codes, demand response, energy law, energy use, power

Electronic versions:

Building Codes and Demand Response of Energy Use (Paper)

URLs:

<http://urn.fi/URN:NBN:fi:tty-201606174283>

URLs:

[https://tutcris.tut.fi/portal/files/6186967/WBC16\\_Vol\\_4.pdf](https://tutcris.tut.fi/portal/files/6186967/WBC16_Vol_4.pdf) (Proceedings of the CIB World Building Congress 2016: Volume IV - Understanding Impacts and Functioning of Different Solutions)

<http://www.wbc16.com/wbc16/welcome.html>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Consensus building in the pre-design phase of building projects

Building projects are unique manoeuvres in which numerous participants who possess different skills work together to complete various tasks. Working processes vary in complexity from simple to very complex. Although the building construction sector has traditional ways of structuring projects, project management professionals are continuously seek new process models and ways to cooperate between people and project participants. This paper focuses on processes in the pre-planning phase of a building project and is based on exploratory study where the conceptual and empirical literature about construction processes and decision-making were reviewed. Over thirty existent models were identified and thirteen of these models, which take a decision making into account, were more closely studied. In addition, decision-making models in other fields were surveyed. Using a hermeneutic cycle approach, the aim of this paper is to investigate a preferable model for the pre-planning phase of construction projects that can produce the main objectives, which is to best serve the end user and the project as a whole. As a final result a new model in the case of the pre-design phase of the building process is introduced and discussed. This paper asks what we have learnt from these foci.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector,

Research group: Capacity Development of Water and Environmental Services CADWES, Research area: Construction Management and Economics, Research group: Real estate development

Contributors: Keinänen, M., Uotila, U., Sorri, J., Teriö, O., Kähkönen, K.

Number of pages: 12

Pages: 561-572

Publication date: 2016

#### Host publication information

Title of host publication: WBC16 Proceedings of the CIB World Building Congress 2016 Volume II : Environmental Opportunities and challenges, Constructing commitment and acknowledging human experiences

Volume: Volume II

Publisher: Tampere University of Technology. Department of Civil Engineering

Editors: Prins, M., Wamelink, H., Giddings, B., Ku, K., Feenstra, M.

ISBN (Electronic): 978-952-15-3741-7

#### Publication series

Name: Tampere University of Technology. Department of Civil Engineering. Construction Management and Economics.

ISSN (Print): 1797-8904

Keywords: consensus building, target setting, decision-making, construction project management, pre-design phase

URLs:

[https://tutcris.tut.fi/portal/files/6186797/WBC16\\_Vol\\_2.pdf](https://tutcris.tut.fi/portal/files/6186797/WBC16_Vol_2.pdf)

URLs:

<http://www.wbc16.com/wbc16/welcome.html>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Bus Transportation Accessibility - Does It Impact Housing Values?

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Real estate development, Research group: Capacity Development of Water and Environmental Services CADWES

Contributors: Kurvinen, A., Sorri, J.

Number of pages: 11

Pages: 321-331

Publication date: 2016

### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016 : Understanding impacts and functioning of different solutions

Volume: IV

Place of publication: Tampere

Publisher: Tampere University of Technology. Department of Civil Engineering

Editors: Nenonen, S., Junnonen, J.

ISBN (Electronic): 978-952-15-3744-8

ASJC Scopus subject areas: Economics, Econometrics and Finance (miscellaneous), Civil and Structural Engineering

Keywords: bus stops, bus traffic, housing prices, public transportation, residential property values, traffic related zones, urban form

Electronic versions:

WBC2016\_Bus\_Transportation\_Accessibility

URLs:

<http://urn.fi/URN:NBN:fi:tty-201606224310>

URLs:

[https://tutcris.tut.fi/admin/files/6372875/WBC2016\\_Bus\\_Transportation\\_Accessibility.pdf](https://tutcris.tut.fi/admin/files/6372875/WBC2016_Bus_Transportation_Accessibility.pdf) (Proceedings of the CIB World Building congress 2016)

<http://www.wbc16.com/wbc16/welcome.html> (Proceedings of the CIB World Building congress 2016)

### Bibliographical note

This paper won World Building Congress 2016 Best Paper Award.

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Real Time Measurements of Temporal Rogue Waves and Spontaneous Modulation Instability in Optical Fiber

We report the first real-time study of temporal rogue waves from spontaneous modulation instability. Time-lens magnification enables the direct capture of transient breather pulses and statistics, with measured intensity profiles in agreement with theory.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Physics

Contributors: Narhi, M., Wetzel, B., Billet, C., Merolla, J., Toenger, S., Sylvestre, T., Morandotti, R., Genty, G., Dias, F., Dudley, J. M.

Number of pages: 2

Publication date: 2016

### Host publication information

Title of host publication: CLEO: QELS\_Fundamental Science 2016

Publisher: Optical Society of America

Article number: FF2A.7

ISBN (Print): 978-1-943580-11-8

Keywords: Pulse propagation and temporal solitons, Nonlinear optics, fibers, Ultrafast measurements

DOIs:

10.1364/CLEO\_QELS.2016.FF2A.7

URLs:

[http://www.osapublishing.org/abstract.cfm?URI=CLEO\\_QELS-2016-FF2A.7](http://www.osapublishing.org/abstract.cfm?URI=CLEO_QELS-2016-FF2A.7)

Source: Bibtex

Source ID: urn:031dc5c9ecd136bcf8278ec95dc470ce

## **Evolution equations based approach for modeling of fatigue in amorphous glassy polymers. On the investigation of fatigue damage development in polycarbonate**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mechanical Engineering and Industrial Systems, Research area: Applied Mechanics

Contributors: Holopainen, S.

Number of pages: 13

Pages: 6675-6687

Publication date: 2016

### **Host publication information**

Title of host publication: Proc. of VII European Congress on Computational Methods in Applied Sciences and Engineering , ECCOMAS Congress 2016. : M. Papadrakakis, V. Papadopoulos, G. Stefanou, V. Plevris (eds.) . Crete Island, Greece, 5 – 10 June 2016

Editors: Papadrakakis, M., Papadopoulos, V., Stefanou, G., Plevris, V.

ISBN (Print): 978-618-82844-0-1

DOIs:

10.7712/100016.2289.11047

URLs:

<https://www.eccomas2016.org/proceedings/pdf/11047.pdf>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## **Characterising the industrial context of engineering change management**

Engineering changes (EC) and their management (ECM) can be categorized from several points of view. In this paper an EC is mainly considered from the position in lifecycle of the object of change: NPD vs. serial production. The performance aspects of engineering change processes emphasize the balancing of speed of the processes and the communication and assessment of consequent changes. ECM practices are studied by comparing two case companies. The cases indicate ECM is highly related to the organization, history and strategy of a company. The increased efficiency in engineering changes is aspired by streamlined ECM in new product development, while enhanced ECM processes apparently batch ECs for increased overall effectivity. The mutual challenge for the studied companies is that the NPD projects result with a set of change requests for serial production.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mechanical Engineering and Industrial Systems, VTT Technical Research Centre of Finland

Contributors: Pulkkinen, A., Huhtala, P., Leino, S., Anttila, J. P., Vainio, V. V.

Number of pages: 10

Pages: 618-627

Publication date: 2016

### **Host publication information**

Title of host publication: Product Lifecycle Management in the Era of Internet of Things : 12th IFIP WG 5.1 International Conference, PLM 2015, Doha, Qatar, October 19-21, 2015, Revised Selected Papers

Publisher: Springer New York LLC

ISBN (Print): 9783319331102

### **Publication series**

Name: IFIP Advances in Information and Communication Technology

Volume: 467

ISSN (Print): 1868-4238

ASJC Scopus subject areas: Information Systems and Management

Keywords: Case study, Comparison, ECM

DOIs:

10.1007/978-3-319-33111-9\_56

### **Bibliographical note**

EXT="Leino, Simo-Pekka"

Source: Scopus

Source ID: 84964894186



### **A follow-up case study of the relation of PLM Architecture, Maturity and Business processes**

This paper presents findings of two research projects, which study current PLM practices and future PLM challenges of global manufacturing companies. This study focuses on maturity of PLM adoption, PLM system architectures and integrations between the tools and seeks a better understanding of a real business phenomenon by comparing case companies to models presented in literature. Data was collected by interviews and benchmarking sessions in six plus three companies in two projects. The companies are categorized by using a four level PLM maturity model. This research indicates that the PLM adoption maturity and architecture models are related to the effectiveness of PLM usage. Service and project businesses seem to be challenging aspects. This is because PLM systems are mainly used in beginning of life activities of the product. In the future also the end of life and middle of life activities should receive more support from the tools and software.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mechanical Engineering and Industrial Systems, Research area: Life-cycle Management

Contributors: Vainio, V. V., Pulkkinen, A.

Number of pages: 7

Pages: 867-873

Publication date: 2016

#### **Host publication information**

Title of host publication: Product Lifecycle Management in the Era of Internet of Things : 12th IFIP WG 5.1 International Conference, PLM 2015, Doha, Qatar, October 19-21, 2015, Revised Selected Papers

Publisher: Springer New York LLC

ISBN (Print): 9783319331102

#### **Publication series**

Name: IFIP Advances in Information and Communication Technology

Volume: 467

ISSN (Print): 1868-4238

ASJC Scopus subject areas: Information Systems and Management

Keywords: PLM maturity, PLM systems architecture, Product lifecycle management

DOIs:

10.1007/978-3-319-33111-9\_79

Source: Scopus

Source ID: 84964911364

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Need of Services and Understanding of Service Providers in Water and Sanitation: A Case of Ethiopia**

Water and sanitation services are basic requirements for the development of a nation. The provision of these services should necessarily be arranged by the national government through policies, and long-term and short-term plans. Moreover, follow-up of the implementation of principle in policies and plans will determine the service level on the ground. This paper is intended to explore gaps in the policy-making and implementation in the areas of water supply in Ethiopia. Review of Ethiopian water sector policy, universal access plans, growth and transformation plans and other literature are employed to achieve the objective of this paper. Moreover, the experiences of the first author that he acquired during data collection for his doctoral study are taken into account to draw conclusions. Hence, the study shows that standards set at the federal level fail to consider the actual situation on the ground and the experts at implementation level are to interpret some aspects of the policy ambiguously. Therefore, this paper recommends the policy-makers and higher officials to consult the people in charge of putting policies in effect to have contextualized and work for uniform desired- output. Service providers need to understand the notion of the receiving community in order to provide the services that satisfy the users.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering

Contributors: Behailu, B. M., Mattila, H.

Number of pages: 10

Pages: 431-440

Publication date: 2016

#### **Host publication information**

Title of host publication: Proceedings of the CIB World Building Congress 2016 Volume IV : Understanding impacts and functioning of different solutions

Publisher: Tampere University of Technology

Editors: Nenonen, S., Junnonen, J.

ISBN (Print): 978-952-15-3744-8

URLs:

[https://tutcris.tut.fi/portal/files/6186967/WBC16\\_Vol\\_4.pdf](https://tutcris.tut.fi/portal/files/6186967/WBC16_Vol_4.pdf)

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3744-8>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## **Multiaxial magneto-mechanical modelling of electrical machines with hysteresis**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering, Department of Mechanical Engineering and Industrial Systems, Research area: Applied Mechanics, Aalto University

Contributors: Rasilo, P., Aydin, U., Singh, D., Martin, F., Kouhia, R., Belahcen, A., Arkkio, A.

Publication date: 2016

### **Host publication information**

Title of host publication: Proceedings of the 8th IET International Conference on Power Electronics, Machines and Drives, PEMD 2016

Publisher: IET, The Institution of Engineering and Technology

ISBN (Print): 978-1-78561-188-9

Electronic versions:

Rasilo2016

DOIs:

[10.1049/cp.2016.0183](https://doi.org/10.1049/cp.2016.0183)

URLs:

<http://urn.fi/URN:NBN:fi:tty-201612204886>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## **Integrating III-V, Si, and polymer waveguides for optical interconnects: RAPIDO**

We present a vision for the hybrid integration of advanced transceivers at 1.3  $\mu\text{m}$  wavelength, and the progress done towards this vision in the EU-funded RAPIDO project. The final goal of the project is to make five demonstrators that show the feasibility of the proposed concepts to make optical interconnects and packet-switched optical networks that are scalable to Pb/s systems in data centers and high performance computing. Simplest transceivers are to be made by combining directly modulated InP VCSELs with 12  $\mu\text{m}$  SOI multiplexers to launch, for example, 200 Gbps data into a single polymer waveguide with 4 channels to connect processors on a single line card. For more advanced transceivers we develop novel dilute nitride amplifiers and modulators that are expected to be more power-efficient and temperature-insensitive than InP devices. These edge-emitting III-V chips are flip-chip bonded on 3  $\mu\text{m}$  SOI chips that also have polarization and temperature independent multiplexers and low-loss coupling to the 12  $\mu\text{m}$  SOI interposers, enabling to launch up to 640 Gbps data into a standard single mode (SM) fiber. In this paper we present a number of experimental results, including low-loss multiplexers on SOI, zero-birefringence Si waveguides, micron-scale mirrors and bends with 0.1 dB loss, direct modulation of VCSELs up to 40 Gbps,  $\pm 0.25\mu\text{m}$  length control for dilute nitride SOA, strong band edge shifts in dilute nitride EAMs and SM polymer waveguides with 0.4 dB/cm loss.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications, VTT Technical Research Centre of Finland, IBM Research, Vertilas GmbH, Scuola Superiore sant'Anna, Tyndall National Institute at National University of Ireland, Cork, Modulight Inc.

Contributors: Aalto, T., Harjanne, M., Offrein, B. J., Caër, C., Neumeier, C., Malacarne, A., Guina, M., Sheehan, R. N., Peters, F. H., Melanen, P.

Publication date: 2016

### **Host publication information**

Title of host publication: Optical Interconnects XVI

Publisher: SPIE

Article number: 97530D

ISBN (Print): 9781628419887

### **Publication series**

Name: Proceedings of SPIE

Volume: 9753

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Applied Mathematics, Computer Science Applications, Electrical and Electronic Engineering, Electronic, Optical and Magnetic Materials, Condensed Matter Physics

Keywords: electro absorption modulator, hybrid integration, optical interconnect, optical interposer, optoelectronics, polymer photonics, semiconductor optical amplifier, Silicon photonics, VCSEL, wavelength multiplexers

DOIs:

10.1117/12.2214786

#### **Bibliographical note**

EXT="Melanen, Petri"

Source: Scopus

Source ID: 84975114015

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Backend infrastructure supporting audio augmented reality and storytelling**

Today, museums are looking for new ways to attract and engage audience. These include virtual exhibitions, augmented reality and 3D modelling based applications, and interactive digital storytelling. The target of all these activities is to provide better experiences for audiences that are very familiar with the digital world. In augmented reality (AR) and interactive digital storytelling (IDS) systems, visual presentation has been dominant. In contrast to this trend, we have chosen to concentrate on auditory presentation. A key element for this is a backend service supporting different client applications. This paper discusses our experiences from designing a portable open source based audio digital asset management system (ADAM), which supports interaction with smart phones and tablets containing audio augmented reality and audio story applications. We have successfully implemented ADAM system and evaluated it in the Museum of Technology in Helsinki, Finland.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: Software engineering, Helsinki Metropolia University of Applied Sciences

Contributors: Salo, K., Giova, D., Mikkonen, T.

Number of pages: 11

Pages: 325-335

Publication date: 2016

#### **Host publication information**

Title of host publication: Human Interface and the Management of Information: Applications and Services : 18th International Conference, HCI International 2016 Toronto, Canada, July 17-22, 2016. Proceedings, Part II

Publisher: Springer Verlag

ISBN (Print): 9783319403960

#### **Publication series**

Name: Lecture Notes in Computer Science

Volume: 9735

ISSN (Print): 0302-9743

ISSN (Electronic): 1611-3349

ASJC Scopus subject areas: Computer Science(all), Theoretical Computer Science

Keywords: Audio augmented reality, Digital asset management, Metadata, Open source DAM, Soundscape

DOIs:

10.1007/978-3-319-40397-7\_31

URLs:

<http://urn.fi/URN:ISBN:978-3-319-40397-7>

Source: Scopus

Source ID: 84978903908

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### **Enhancing old laboratory experiment using flipped learning: Towards self-regulating collaborative groups in blended learning environment**

This paper demonstrates how learning outcome of a traditional student laboratory has been improved using blended and flipped learnings in a cost-effective way. The innovation process was based on four important elements: the subject matter, educational theory, redefinition of the roles of teacher and students, and technology-driven utilities intended for education. Also, prelab activities were refurbished in order to better prepare students for the actual experiments. Teaching

and learning relationship was redesigned to support learner-centred model of education, and on-site activities occurring in the laboratory room were reformulated to advance self-regulation and learner autonomy. As a consequence, the role of teacher is steered towards mentor-like activity, and hence, a teacher-mentor can use his own expertise to strengthen the knowledge level of students via on-site professional facilitation.

To be more specific, prelab activities were delivered using a virtual laboratory and a teaser video. The main role of the teaser video is to allow a remote visit to the physical laboratory room before students actually enter there. The teaser video delivers interesting visual information of the laboratory equipment when it is fully operational, and hence, students can identify causal connections of all devices affecting the physical system from anyplace at any time. The virtual laboratory, on the other hand, enables students to observe several physical quantities and their curvatures which cannot be observed nor displayed by the physical devices in the laboratory room. Furthermore, the open-ended nature of the virtual laboratory also enables students to use it as a subject for their own active research. The teaser video and virtual laboratory help students to develop intuition, and they also strengthen students' preparation in a timely fashion manner. As a result, more time is released for active on-site student collaboration and teacher facilitated intellectual discussion. Interestingly, the virtual laboratory is key to establish highly collaborative and activity-based learning environment inside the laboratory room. Finally, it is shown that the new implementation of the laboratory work significantly reduces implementation costs.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Automation Science and Engineering, Research area: Information Systems in Automation, Research area: Dynamic Systems

Contributors: Pyrhönen, V.

Number of pages: 9

Publication date: 2016

### **Host publication information**

Title of host publication: SEFI conference 2016 : Engineering Education on Top of the World: Industry University Cooperation

ISBN (Electronic): 9782873520144

ASJC Scopus subject areas: Education

Keywords: Blended Learning, Cost Reduction, Flipped Learning, Laboratory

URLs:

[http://www.sefi.be/conference-2016/papers/Sustainability\\_and\\_Engineering\\_Education/pyrhonen-enhancing-old-laboratory-experiment-using-flipped-learning--towards-self-regulating-collaborative-.pdf](http://www.sefi.be/conference-2016/papers/Sustainability_and_Engineering_Education/pyrhonen-enhancing-old-laboratory-experiment-using-flipped-learning--towards-self-regulating-collaborative-.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Computer-supported collaborative learning: Praxes in new cell-oriented configurable PC-classroom**

Currently, technology-enhanced learning environments are a research hotspot in engineering education. Universities invest in modern environments equipped with the newest audiovisual hardware, computers and web-technologies. These environments support learner-centred model of education, which highlights active role of learners, learning-by-doing, and collaborative learner autonomy in a democratic atmosphere. Therefore, traditional teacher-led classrooms can be transformed to more diverse and more creative environments in which teachers and learners have relatively different roles compared with the traditional classroom.

In this paper, we present layout, construction and hardware of our newly developed technology-mediated, configurable, and cell-oriented PC-classroom, which play a key role in our teaching development. We exemplify how the classroom has helped us to improve our automation science and control engineering education. To be more specific, we have adopted the well-known concept of computer-supported collaborative learning (CSCL), which concerns how students can learn together with the help of computers. We also demonstrate how redefining and redesigning the nature of activities occurring in modern learning environments can improve the effectiveness of contact teaching, and hence, allow learning episodes to be more impactful compared with the traditional teacher-led classroom. We would like to pinpoint that redefinition and redesign have allowed us, as teachers, to take the position of a facilitating guide, or mentor, which work in close cooperation with students, and thereby, is able to strengthen the knowledge level of students through intellectual face-to-face discussion as well as through technology-supported communication.

Furthermore, our new classroom has enabled hands-on, competitive, cyber-physical attack-defence events to be conducted, which improve our automation security training. The events have invited participants from industry and academia, but most importantly, they have involved students. During the events, we have offered opportunities for students to make demonstration-of-skills to the participants from business. As a consequence, the new environment has enabled acts of openings for university-business cooperation in terms of education and recruit, free of charge. To our experience and according to student feedback, our redefined ways of conducting teaching has improved student motivation as well as increased their timely investment towards learning activities, which has eventually translated to better grades and overall satisfaction.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Automation Science and Engineering, Research area: Information Systems in Automation

Contributors: Pyrhönen, V., Seppälä, J., Salmenperä, M.

Number of pages: 9

Publication date: 2016

### Host publication information

Title of host publication: SEFI conference 2016 : Engineering Education on Top of the World: Industry University Cooperation

ISBN (Electronic): 9782873520144

ASJC Scopus subject areas: Education

Keywords: Computer-Supported Collaborative Learning, Learner-Centred Learning, Learning Environment, Teaching Technology

URLs:

[http://www.sefi.be/conference-2016/papers/Engineering\\_Skills/pyrhonen-computer-supported-collaborative-learning--praxes-223.pdf](http://www.sefi.be/conference-2016/papers/Engineering_Skills/pyrhonen-computer-supported-collaborative-learning--praxes-223.pdf)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Commercialising reclaimed materials in earthworks – guidelines for productization and the process of appending these materials in the Finnish national code of practice

To decrease the use of non-renewable natural resources as well as environmental effects of earth-works, natural aggregate materials can be replaced with recycled materials acquired from surplus soil, industrial by-products and waste, etc. When wishing to increase the usage of these reclaimed materials (=“UUMA”-material), the usage must be straightforward for developers, designers and constructors alike. To make this possible, the materials must have design guidelines for their appropriate applications. They must be productized and CE marked or otherwise authorized, and the construction guidelines for the materials must be included in the Finnish general specifications for in-frastructural construction works (InfraRYL). As productization is especially important in increasing the usage of UUMA materials, guidelines for vendors are being drawn that present information on commercializing reclaimed materials to be used in earthworks. The guidelines for productization are being prepared in the Finnish national UUMA2 programme (2013-2017, [www.uuma2.fi](http://www.uuma2.fi)), which was created to promote the use of recycled materials in earthworks.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research area: Infrastructure Construction, Research group: Earth Constructions, Research group: Track Structures, Ramboll Finland Ltd.

Contributors: Koivisto, K., Forsman, J., Ronkainen, M., Lahtinen, P., Kolisoja, P., Kuula, P.

Number of pages: 10

Publication date: 2016

### Host publication information

Title of host publication: Proceedings of the 17th Nordic Geotechnical Meeting Reykjavik Iceland : Challenges in Nordic Geotechnic 25th - 28th of May

Place of publication: Reykjavik

Publisher: Icelandic Geotechnical Society

ISBN (Electronic): 978-9935-24-002-6

URLs:

<http://www.ngm2016.com/>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Fabrication and characterization of broadband superluminescent diodes for 2 μm wavelength

Single-mode superluminescent diodes operating at 2 μm wavelength are reported. The structures are based on GaSb material systems and were fabricated by molecular beam epitaxy. Several waveguide designs have been implemented. A continuous-wave output power higher than 35 mW is demonstrated for a spectrum centered at around 1.92 μm. We show that the maximum output power of the devices is strongly linked to spectrum width. Device having low output power exhibit a wide spectrum with a full-width half-maximum (FWHM) as large as 209 nm, while devices with highest output power exhibit a narrower spectrum with about 61 nm FWHM.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications

Contributors: Zia, N., Viheriälä, J., Koskinen, R., Koskinen, M., Suomalainen, S., Guina, M.  
Publication date: 2016

#### Host publication information

Title of host publication: Light-Emitting Diodes: Materials, Devices, and Applications for Solid State Lighting XX  
Publisher: SPIE  
Article number: 97680Q  
ISBN (Electronic): 9781510600034

#### Publication series

Name: Proceedings of SPIE  
Volume: 9768  
ISSN (Print): 0277-786X  
ISSN (Electronic): 1996-756X  
ASJC Scopus subject areas: Applied Mathematics, Computer Science Applications, Electrical and Electronic Engineering, Electronic, Optical and Magnetic Materials, Condensed Matter Physics  
Keywords: Gallium antimonide, SLD design, Superluminescent diodes, Tilt waveguide  
Electronic versions:  
Proc\_SPIE\_9768\_97680Q\_N\_Zia\_et\_al\_author\_prepared\_version  
DOIs:  
10.1117/12.2209720  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201706201608>

#### Bibliographical note

INT=orc,"Koskinen, Mervi"  
Source: Scopus  
Source ID: 84978727362  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Accurate depth estimation from a sequence of monocular images supported by proprioceptive sensors

This paper describes an extended Kalman filter based algorithm for fusion of monocular vision measurements, inertial rate sensor measurements, and camera motion. The motion of the camera between successive images generates a baseline for range computations by triangulation. The recursive estimation algorithm is based on extended Kalman filtering. The depth estimation accuracy is strongly affected by mutual observer and feature point geometry, measurement accuracy of observer motion parameters and line of sight to a feature point. The simulation study investigates how the estimation accuracy is affected by the following parameters: linear and angular velocity measurement errors, camera noise, and observer path. These results draw requirements to the instrumentation and observation scenarios. It was found that under favorable conditions the error in distance estimation does not exceed 2% of the distance to a feature point.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Automation Science and Engineering, Research area: Dynamic Systems, Research area: Measurement Technology and Process Control, Research group: Positioning  
Contributors: Davidson, P., Raunio, J. P., Piché, R.  
Number of pages: 9  
Pages: 249-257  
Publication date: 2016

#### Host publication information

Title of host publication: 23rd Saint Petersburg International Conference on Integrated Navigation Systems, ICINS 2016 - Proceedings  
Publisher: State Research Center of the Russian Federation  
ISBN (Electronic): 9785919950370  
ASJC Scopus subject areas: Computer Networks and Communications, Signal Processing, Electrical and Electronic Engineering, Information Systems  
Keywords: Computer vision, Gyroscope, IMU, Odometer, Structure from motion  
URLs:  
<http://www.scopus.com/inward/record.url?scp=84979573597&partnerID=8YFLogxK> (Link to publication in Scopus)  
Source: Scopus  
Source ID: 84979573597  
Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Computer vision aided navigation systems**

The paper considers the possible use of computer vision systems for INS aiding. Two methods of navigation data obtaining from the image sequence are analyzed. The first method uses the features of architectural elements in indoor and urban conditions for generation of object attitude parameters. The second method is based on extraction of general features in the image and is more widely applied. Besides the orientation parameters, the second method estimates the object displacement, and thus can be used as visual odometry technique. The described algorithms can be used to develop small-sized MEMS navigation systems efficiently operating in urban conditions.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Automation Science and Engineering, Research group: Positioning, ITMO University

Contributors: Davidson, P., Merkulova, I.

Number of pages: 3

Pages: 560-562

Publication date: 2016

#### **Host publication information**

Title of host publication: 23rd Saint Petersburg International Conference on Integrated Navigation Systems, ICINS 2016 - Proceedings

Publisher: State Research Center of the Russian Federation

ISBN (Electronic): 9785919950370

ASJC Scopus subject areas: Computer Networks and Communications, Signal Processing, Electrical and Electronic Engineering, Information Systems

Keywords: Camera, Computer vision, Data fusion, Image processing, Inertial system, Orientation

URLs:

<http://www.scopus.com/inward/record.url?scp=84979499890&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84979499890

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **High-power 1550 nm tapered DBR lasers fabricated using soft UV-nanoimprint lithography**

Paper reports the DBR-RWG surface grating design, the fabrication process, and the output characteristics of tapered DBR laser diodes for the applications, like for example LIDAR and range finding, that require eye-safe high-power single-mode coherent light sources. The fabricated regrowth-free DBR AlGaInAs/InP lasers exhibited a CW output power as high as 560 mW in single-mode operation at room temperature. At maximum output power the SMSR was 38 dB, proving the excellent behavior of the surface gratings. The tapered section enabled scaling the maximum CW power at room temperature from 125 mW to 560 mW, by increasing its length from 0.5 mm to 4.0 mm. The paper discusses the limitations and performance variation associated to the power scaling by using the tapered section length as a scaling parameter.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Nanophotonics, Research group: Semiconductor Technology and Applications, Materials Research Laboratory, Turun Yliopisto/Turun Biomateriaalikeskus

Contributors: Viheriälä, J., Aho, A. T., Mäkelä, J., Salmi, J., Virtanen, H., Leinonen, T., Dumitrescu, M., Guina, M.

Number of pages: 7

Publication date: 2016

#### **Host publication information**

Title of host publication: High-Power Diode Laser Technology and Applications XIV

Publisher: SPIE

Article number: 97330Q

ISBN (Electronic): 9781628419689

#### **Publication series**

Name: SPIE Conference Proceedings

Publisher: SPIE

Volume: 9733

ISSN (Print): 0277-786X

ASJC Scopus subject areas: Applied Mathematics, Computer Science Applications, Electrical and Electronic Engineering, Electronic, Optical and Magnetic Materials, Condensed Matter Physics

Keywords: 1550 nm laser diode, DBR, Power scaling, Tapered laser diode

DOIs:

10.1117/12.2207423

#### **Bibliographical note**

INT=orc,"Aho, Antti T."

JUFID=71479

Source: Scopus

Source ID: 84978785955

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### **Mathematical Parametrisation of Irradiance Transitions Caused by Moving Clouds for PV System Analysis**

Irradiance transitions caused by moving clouds can have considerable negative effects on the operation of photovoltaic (PV) systems. They may lead to failures in maximum power point tracking causing extra losses and to mismatch power losses due to partial shading. Further, they can cause significant fluctuations in the output power of PV systems.

This paper presents a method to parametrise irradiance transitions caused by moving clouds based on a mathematical model of the transitions. Irradiance transitions were parametrised by four variables: shading strength, shape related parameter  $b$ , speed and direction of movement which have no correlation with each other. The applicability of the parametrisation method in PV system analysis was demonstrated by simulations. The simulation results show that the developed parametrisation method is suitable for long-term PV system analysis.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering

Contributors: Lappalainen, K., Valkealahti, S.

Number of pages: 5

Pages: 1485-1489

Publication date: 2016

#### **Host publication information**

Title of host publication: 32nd European Photovoltaic Solar Energy Conference and Exhibition (32nd EU PVSEC), 20–24 June, 2016, Munich, Germany

ISBN (Electronic): 3-936338-41-8

DOIs:

10.4229/EUPVSEC20162016-5AO.8.4

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### **Recognising the culture context in information search**

##### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pori Department, Research group: Software Engineering and Intelligent Systems, Christian-Albrechts-University Kiel

Contributors: Jaakkola, H., Thalheim, B.

Number of pages: 9

Pages: 167-185

Publication date: 2016

##### **Host publication information**

Title of host publication: Proceedings of the 26th International Conference on Information Modelling and Knowledge Bases - EJC 2016. : June 6-10, 2016, Tampere, Finland.

Volume: 18

Place of publication: Tampere

Publisher: Tampere University of Technology Pori Department

Editors: Jaakkola, H., Thalheim, B., Kiyoki, Y., Yoshida, N.

ISBN (Electronic): 978-952-15-3747-9

##### **Publication series**

Name: Tampere University of Technology Pori Department Publications

No.: 18

ISSN (Electronic): 2323-8976

URLs:

<http://www.tut.fi/en/ejc/ejc-2016/index.htm>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review



## Tag suggestions from social media profiles

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Pori Department, Research group: Software Engineering and Intelligent Systems  
Contributors: Rantanen, P., Sillberg, P., Soini, J., Jaakkola, H.  
Number of pages: 8  
Pages: 387-394  
Publication date: 2016

### Host publication information

Title of host publication: Proceedings of the 26th International Conference on Information Modelling and Knowledge Bases - EJC 2016. : June 6-10, 2016, Tampere, Finland.  
Volume: 18  
Place of publication: Tampere  
Publisher: Tampere University of Technology  
Editors: Jaakkola, H., Thalheim, B., Kiyoki, Y., Yoshida, N.  
ISBN (Electronic): 978-952-15-3747-9

### Publication series

Name: Tampere University of Technology Pori Department Publications  
Publisher: Tampere University of Technology  
ISSN (Electronic): 2323-8976  
Electronic versions:  
25\_p606\_Rantanen  
URLs:  
<http://urn.fi/URN:NBN:fi:tty-201712012298>  
URLs:  
<http://www.tut.fi/en/ejc/ejc-2016/>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### A continuum damage model for creep fracture and fatigue analyses

In this paper a thermodynamically consistent formulation for creep and creep-damage modelling is given. The model is developed for isotropic solids by using proper expressions for the Helmholtz free energy and the complementary form of the dissipation potential, and can be proven to fulfill the dissipation inequality. Also the coupled energy equation is derived. Continuum damage model with scalar damage variable is used to facilitate simulations with tertiary creep phase. The complementary dissipation potential is written in terms of the thermodynamic forces dual to the dissipative variables of creep strain-rate and damage-rate. The model accounts for the multiaxial stress state and the difference in creep rupture time in shear and axial loading as well as in tensile and compressive axial stress. In addition, the model is simple and only four to eight material model parameters are required in addition to the elasticity parameters. A specific version of the proposed model is obtained when constrained to obey the Monkman-Grant relationship between the minimum creep strain-rate and the creep rupture time. The applicability of the Monkman-Grant hypothesis in the model development is discussed. The proposed 3D-model is implemented in the ANSYS finite element software by the USERMAT subroutine. Material parameters have been estimated for the 7CrMoVTiB10-10 steel (T24) for temperatures ranging from 500 to 600 degrees of celcius. Some test cases with cyclic thermal fatigue analysis are presented.

### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Mechanical Engineering and Industrial Systems, Research area: Applied Mechanics, Valmet Technologies Oy, P.O. Box 109, FI-33101 Tampere, Finland  
Contributors: Kauppila, P., Kouhia, R., Ojanperä, J., Saksala, T., Sorjonen, T.  
Number of pages: 8  
Pages: 887-894  
Publication date: 2016

### Host publication information

Title of host publication: 21st European Conference on Fracture, ECF21, 20-24 June 2016, Catania, Italy

### Publication series

Name: Procedia Structural Integrity  
Volume: 2

ISSN (Print): 2452-3216

DOIs:

10.1016/j.prostr.2016.06.114

URLs:

<http://www.sciencedirect.com/science/article/pii/S2452321616301196>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Validation of the method to evaluate the corrosion propagation stage by hygrothermal simulation**

Evaluating the propagation period for reinforcement corrosion in concrete facades is an important but complex task which contains a high level of uncertainty. Corrosion current intensity during the propagation period have been measured in a large number of studies and there is a general consensus in regard to factors affecting carbonation induced corrosion. Hence, a proper evaluation of hygrothermal conditions in concrete facade becomes crucial. In this study a method to calculate the corrosion propagation period was validated based upon a field survey of prefabricated concrete facades in large-panel apartment buildings. The method combines existing corrosion propagation models and the Delphin dynamic hygrothermal simulation tool, and takes into consideration material properties, carbonation depth, concrete cover depth, indoor and outdoor climate loads. With the proposed method, propagation consists of a time that is required for a concrete cover to begin cracking and a further expansion of the crack to open to 0.3 mm in width. As a result, the method is validated via the correlation between measured and calculated propagation periods across a range of twenty years. The sensitivity of the results are also studied. The method allows for an evaluation to be carried out on degradation, residual service life, and the need for the renovation of reinforced concrete facades.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, Tallinn University of Technology

Contributors: Ilomets, S., Kalamees, T., Lahdensivu, J.

Number of pages: 8

Pages: 1113-1120

Publication date: 2016

#### **Host publication information**

Title of host publication: CESB 2016 - Central Europe Towards Sustainable Building 2016: Innovations for Sustainable Future

Publisher: Czech Technical University in Prague

ISBN (Electronic): 9788027102488

ASJC Scopus subject areas: Civil and Structural Engineering, Building and Construction

Keywords: Concrete damage, Corrosion model, Corrosion propagation, Hygrothermal simulation, Service life

#### **Bibliographical note**

EXT="Kalamees, Targo"

Source: Scopus

Source ID: 84986883167

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Optical fiber amplifier with spectral compression elements for high-power laser pulse generation**

We report main features of spectral compression of parabolic pulses in nonlinear optical fibers. It is shown that the variational analysis correctly describes evolution of pulse parameters during spectral compression. The model of cascade amplifier system employing spectral compression is developed to achieve superior spectral densities. The proposed configuration is promising as optical pulse preamplifier for operation in the high-energy pulse laser systems.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, University de Mons, Ulyanovsk State University, Optoelectronic Research Center

Contributors: Fotiadi, A. A., Korobko, D. A., Okhotnikov, O. G., Zolotovskii, I. O.

Publication date: 2016

#### **Host publication information**

Title of host publication: Nonlinear Optics and its Applications IV

Volume: 9894

Publisher: SPIE

Article number: 989411

ISBN (Electronic): 9781510601390

### Publication series

Name: Proceedings of SPIE

Volume: 9894

ISSN (Print): 0277-786X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Electrical and Electronic Engineering, Applied Mathematics

Keywords: Fiber optics amplifiers, high-power laser pulses, nonlinear spectral compression, phase self-modulation

DOIs:

10.1117/12.2223637

Source: Scopus

Source ID: 84985911601

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Dots-on-the-fly electron beam lithography

We demonstrate a novel approach for electron-beam lithography (EBL) of periodic nanostructures. This technique can rapidly produce arrays of various metallic and etched nanostructures with line and pitch dimensions approaching the beam spot size. Our approach is based on often neglected functionality which is inherent in most modern EBL systems. The raster/vector beam exposure system of the EBL software is exploited to produce arrays of pixel-like spots without the need to define coordinates for each spot in the array. Producing large arrays with traditional EBL techniques is cumbersome during pattern design, usually leads to large data files and easily results in system memory overload during patterning. In Dots-on-The-fly (DOTF) patterning, instead of specifying the locations of individual spots, a boundary for the array is given and the spacing between spots within the boundary is specified by the beam step size. A designed pattern element thus becomes a container object, with beam spacing acting as a parameterized location list for an array of spots confined by that container. With the DOTF method, a single pattern element, such as a square, rectangle or circle, can be used to produce a large array containing thousands of spots. In addition to simple arrays of nano-dots, we expand the technique to produce more complex, highly tunable arrays and structures on substrates of silicon, ITO/ FTO coated glass, as well as uncoated fused silica, quartz and sapphire.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Communications and Positioning, Optoelectronics Research Centre, Research group: Nanophotonics

Contributors: Isotalo, T. J., Niemi, T.

Number of pages: 7

Publication date: 2016

### Host publication information

Title of host publication: SPIE Proceedings : Alternative Lithographic Technologies VIII

Volume: 9777

Publisher: SPIE

Editor: Bencher, C.

Article number: 97771E

ISBN (Electronic): 9781510600126

### Publication series

Name: Proceedings of SPIE

Publisher: SPIE

ISSN (Print): 0277-786X

ISSN (Electronic): 1996-756X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Electrical and Electronic Engineering, Applied Mathematics

Keywords: electron beam lithography, nano-fabrication, nano-particle arrays, optoelectronics, periodic nano-structures, plasmonics

DOIs:

10.1117/12.2219136

Source: Scopus

Source ID: 84981516864

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Nanoscale barrier coating on BOPP packaging film by ALD

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication  
Organisations: Department of Materials Science, Research group: Paper Converting and Packaging  
Contributors: Lahti, J.  
Number of pages: 13  
Pages: 493-505  
Publication date: 2016

#### Host publication information

Title of host publication: TAPPI PLACE Conference 2016: Exploring New Frontiers  
Publisher: TAPPI Press  
ISBN (Electronic): 9781510823563  
ASJC Scopus subject areas: Media Technology, Mechanical Engineering, Materials Science(all), Chemistry(all), Chemical Engineering(all)  
Source: Scopus  
Source ID: 84981736600  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Full-Field Temperature and Strain Measurement in Dynamic Tension Tests on SS 304

The thermomechanical response of 304-stainless steel tension specimens to a range of strain rates from  $7 \times 10^{-3} \text{ s}^{-1}$  to  $2600 \text{ s}^{-1}$  was investigated. Quasi-static tests ( $7 \times 10^{-3}$  to  $0.8 \text{ s}^{-1}$ ) were completed on a hydraulic load frame, intermediate tests ( $200 \text{ s}^{-1}$ ) were performed with a modified pressure bar, and high strain rate tests ( $2600 \text{ s}^{-1}$ ) on a split Hopkinson pressure bar. Full-field infrared thermography and strain measurements were recorded during each test. Infrared measurements were taken using the Telops FAST-IR 1000 infrared camera at rates up to 30,000 frames per second. 2D-DIC was used to compute strain from simultaneously recorded visible images taken at rates up to 90,000 frames per second. Max temperatures of  $290 \text{ }^\circ\text{C}$  were recorded in the necking region of a uniaxial specimen at a strain rate of  $2600 \text{ s}^{-1}$ . These measurements can be used to investigate the transition of isothermal deformation to adiabatic deformation and to determine the portion of plastic work converted to heat at each strain rate.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Materials Science, Research group: Materials Characterization, The Ohio State University, Columbus, OH, USA, Department of Mechanical Engineering  
Contributors: Smith, J., Kuokkala, V., Seidt, J., Gilat, A.  
Number of pages: 8  
Pages: 37-44  
Publication date: 2016

#### Host publication information

Title of host publication: Dynamic Behavior of Materials, Volume 1 : Proceedings of the 2016 Annual Conference on Experimental and Applied Mechanics  
Publisher: Springer International Publishing  
ISBN (Print): 978-3-319-41131-6  
ISBN (Electronic): 978-3-319-41132-3

#### Publication series

Name: Conference proceedings of the Society for Experimental Mechanics  
ISSN (Electronic): 2191-5644  
DOIs:  
10.1007/978-3-319-41132-3\_6

#### Bibliographical note

JUF0ID=72540  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Functionalizing Surface Electrical Potential of Hydroxyapatite Coatings

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Materials Science, Research group: Surface Engineering, Riga Technical University, University of Adelaide  
Contributors: Pluduma, L., Freimanis, E., Gross, K., Koivuluoto, H., Algate, K., Haynes, D., Vuoristo, P.  
Number of pages: 6  
Pages: 12-17

Publication date: 2016

#### Host publication information

Title of host publication: 11th International Conference Medical Applications of Novel Biomaterials and Nanotechnology  
Volume: 102  
ISBN (Print): 978-3-0357-1125-7

#### Publication series

Name: Advances in Science and Technology  
Volume: 102  
ISSN (Print): 1661-819X

#### Bibliographical note

JUF0ID=75599

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Integrated urban water management, the green economy and institutional eco-innovations

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Civil Engineering  
Contributors: Hukka, J. J., Nyanchaga, E. N., Katko, T. S.  
Number of pages: 11  
Pages: 260-271  
Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016 : Volume III - Building up business operations and their logic. Shaping materials and technologies  
Place of publication: Tampere  
Publisher: Tampere University of Technology. Department of Civil Engineering  
Editors: Saari, A., Huovinen, P.  
ISBN (Print): 978-952-15-3743-1  
URLs:

[https://tutcris.tut.fi/portal/files/6186903/WBC16\\_Vol\\_3.pdf](https://tutcris.tut.fi/portal/files/6186903/WBC16_Vol_3.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Institutional development is the key for sustainable water services in the built environment

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Civil Engineering  
Contributors: Katko, T. S., Hukka, J. J.  
Number of pages: 12  
Pages: 419-430  
Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016 : Volume IV - Understanding impacts and functioning of different solutions  
Place of publication: Tampere  
Publisher: Tampere University of Technology. Department of Civil Engineering  
Editors: Nenonen, S., Junnonen, J.  
ISBN (Print): 978-952-15-3744-8  
URLs:

[https://tutcris.tut.fi/portal/files/6186967/WBC16\\_Vol\\_4.pdf](https://tutcris.tut.fi/portal/files/6186967/WBC16_Vol_4.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Sound Event Detection in Multichannel Audio Using Spatial and Harmonic Features

In this paper, we propose the use of spatial and harmonic features in combination with long short term memory (LSTM) recurrent neural network (RNN) for automatic sound event detection (SED) task. Real life sound recordings typically have many overlapping sound events, making it hard to recognize with just mono channel audio. Human listeners have been successfully recognizing the mixture of overlapping sound events using pitch cues and exploiting the stereo (multichannel)

audio signal available at their ears to spatially localize these events. Traditionally SED systems have only been using mono channel audio, motivated by the human listener we propose to extend them to use multichannel audio. The proposed SED system is compared against the state of the art mono channel method on the development subset of TUT sound events detection 2016 database. The proposed method improves the F-score by 3.75% while reducing the error rate by 6%.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Signal Processing, Research group: Audio research group - ARG, Research group: Audio research group

Contributors: Adavanne, S., Parascandolo, G., Pertilä, P., Heittola, T., Virtanen, T.

Pages: 6-10

Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the Detection and Classification of Acoustic Scenes and Events 2016 Workshop (DCASE2016)

Publisher: Tampere University of Technology. Department of Signal Processing

ISBN (Electronic): 978-952-15-3807-0

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3807-0>

Additional files:

Adavanne\_DCASE2016

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Direct Measurement of Temporal Rogue Waves Generated by Spontaneous Modulation Instability

We measure the real time intensity profiles of localized structures emerging from spontaneous modulation instability. We show that the results can be interpreted in terms of analytical solutions of the nonlinear Schrödinger equation.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Physics, Research area: Optics, Research group: Nonlinear Fiber Optics, Institut FEMTO-ST, Institut FEMTO-ST, Université de Franche-Comté, School of Mathematical Sciences, University College Dublin, Institut FEMTO-ST, UMR 6174 CNRS-Université de Franche-Comté

Contributors: Narhi, M., Wetzel, B., Billet, C., Merolla, J., Toenger, S., Sylvestre, T., Morandotti, R., Dias, F., Genty, G., Dudley, J. M.

Publication date: 2016

#### Host publication information

Title of host publication: Frontiers in Optics 2016

Publisher: Optical Society of America

Article number: FTu3I.4

ISBN (Print): 978-1-943580-19-4

URLs:

<https://www.osapublishing.org/abstract.cfm?uri=fio-2016-FTu3I.4>

#### Bibliographical note

EXT="Toenger, Shanti"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### High Dynamic Range Single-Shot Spectral Measurements of Spontaneous Modulation Instability

We demonstrate a mechanical streak camera capturing single-shot spectra with 40 dB dynamic range. We use the technique to identify for the first time breather collisions from spectra of spontaneous modulation instability in a fiber.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Physics, Research area: Optics, Research group: Nonlinear Fiber Optics, Research group: Applied Optics, Institut FEMTO-ST, Université de Franche-Comté, Institut FEMTO-ST, UMR 6174 CNRS-Université de Franche-Comté

Contributors: Närhi, M., Tengvall, M., Toivonen, J., Dudley, J. M., Genty, G.

Publication date: 2016

### Host publication information

Title of host publication: Frontiers in Optics 2016

Publisher: Optical Society of America (OSA)

Article number: FF2B.1

ISBN (Print): 978-1-943580-19-4

URLs:

<https://www.osapublishing.org/abstract.cfm?uri=FiO-2016-FF2B.1>

### Bibliographical note

INT=mat,"Tengvall, Mira"

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Simultaneous binary hash and features learning for image retrieval

Content-based image retrieval systems have plenty of applications in modern world. The most important one is the image search by query image or by semantic description. Approaches to this problem are employed in personal photo-collection management systems, web-scale image search engines, medical systems, etc. Automatic analysis of large unlabeled image datasets is virtually impossible without satisfactory image-retrieval technique. It's the main reason why this kind of automatic image processing has attracted so much attention during recent years. Despite rather huge progress in the field, semantically meaningful image retrieval still remains a challenging task. The main issue here is the demand to provide reliable results in short amount of time. This paper addresses the problem by novel technique for simultaneous learning of global image features and binary hash codes. Our approach provide mapping of pixel-based image representation to hash-value space simultaneously trying to save as much of semantic image content as possible. We use deep learning methodology to generate image description with properties of similarity preservation and statistical independence. The main advantage of our approach in contrast to existing is ability to fine-tune retrieval procedure for very specific application which allow us to provide better results in comparison to general techniques. Presented in the paper framework for data-dependent image hashing is based on use two different kinds of neural networks: convolutional neural networks for image description and autoencoder for feature to hash space mapping. Experimental results confirmed that our approach has shown promising results in compare to other state-of-the-art methods.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Signal Processing, Research group: Computational Imaging-CI, Don State Technical University, Univ of Texas at San Antonio

Contributors: Frantc, V. A., Makov, S. V., Voronin, V. V., Marchuk, V. I., Semenishchev, E. A., Egiazarian, K. O., Agaian, S.

Publication date: 2016

### Host publication information

Title of host publication: Mobile Multimedia/Image Processing, Security, and Applications 2016

Publisher: SPIE

Article number: 986902

ISBN (Electronic): 9781510601109

### Publication series

Name: SPIE Conference Proceedings

Volume: 9869

ISSN (Print): 0277-786X

ASJC Scopus subject areas: Electronic, Optical and Magnetic Materials, Condensed Matter Physics, Computer Science Applications, Applied Mathematics, Electrical and Electronic Engineering

Keywords: autoencoder, content-based image retrieval, deep convolutional neural network, semantic hashing

DOIs:

10.1117/12.2223605

Source: Scopus

Source ID: 84991480411

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Relations between civil engineering students' approaches to learning, perceptions of the development of professional skills and perceived workload

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector, Teaching and Learning Services, University of Helsinki

Contributors: Salmisto, A., Postareff, L., Nokelainen, P.  
Publication date: 2016

#### Host publication information

Title of host publication: 44th Annual Conference of the European Society for Engineering Education SEFI2016: Proceedings : 12-15 September 2016, Tampere, Finland  
ISBN (Print): 978-2-87352-014-4  
Keywords: Engineering education, professional skills, approaches to learning, perceived workload  
URLs:

[http://www.sefi.be/conference-2016/papers/Open\\_and\\_Online\\_Engineering\\_Education\\_\\_Engineering\\_Education\\_Research/salmisto-relations-between-civil-engineering-students'-approaches-54\\_a.pdf](http://www.sefi.be/conference-2016/papers/Open_and_Online_Engineering_Education__Engineering_Education_Research/salmisto-relations-between-civil-engineering-students'-approaches-54_a.pdf)  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Development of students' multidisciplinary collaboration skills by simulation of the design process

##### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector  
Contributors: Salmisto, A., Keinänen, M., Kähkönen, K.  
Pages: 348-360  
Publication date: 2016

##### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume I - Creating built environments of new opportunities.

Volume: 1  
ISBN (Print): 978-952-15-3741-7  
Keywords: collaboration, multidisciplinary, engineering education, collaborative learning, design process  
URLs:

[https://tutcris.tut.fi/portal/files/6186667/WBC16\\_Vol\\_1.pdf](https://tutcris.tut.fi/portal/files/6186667/WBC16_Vol_1.pdf)  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### A new waveguiding mechanism based upon geometric phase

We demonstrate light guiding in a locally twisted anisotropic medium in the absence of a refractive index gradient. The transverse phase modulation required to compensate diffraction is provided by the Pancharatnam-Berry phase.

##### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Physics, Research group: Nonlinear Optics, Research area: Optics, Univ Porto, Universidade do Porto, Fac Ciencias, Ctr Fis Porto, Univ Naples Federico II, Commonwealth Scientific & Industrial Research Organisation (CSIRO), University of Naples Federico II, Dipartimento Fis, Complesso Univ Monte St Angelo, Consiglio Nazionale delle Ricerche (CNR), CNR, SPIN  
Contributors: Alberucci, A., Pannian, J. C., Slussarenko, S., Piccirillo, B., Santamato, E., Marrucci, L., Assanto, G.  
Publication date: 2016

##### Host publication information

Title of host publication: Frontiers in Optics 2016  
Publisher: Optical Society of America (OSA)  
Article number: FF3H.3  
ISBN (Print): 978-1-943580-19-4  
URLs:  
<https://www.osapublishing.org/abstract.cfm?uri=FiO-2016-FF3H.3>  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Diffraction compensation of finite beams in hyperbolic metamaterials

The propagation of finite size beams in a hyperbolic metamaterial is modeled as a moving particle of negative mass. We show the occurrence of anomalous diffraction, diffraction compensation and profile recovery for any input excitation.

##### General information

Publication status: Published



MoE publication type: A4 Article in a conference publication  
Organisations: Department of Physics, Research group: Nonlinear Optics, Research area: Optics, Univ Porto, Universidade do Porto, Fac Ciencias, Ctr Fis Porto  
Contributors: Pannian, J. C., Alberucci, A., Boardman, A., Assanto, G.  
Publication date: 2016

#### Host publication information

Title of host publication: Laser science 2016  
Publisher: Optical Society of America (OSA)  
Article number: JW4A.10  
ISBN (Print): 978-1-943580-19-4  
URLs:

<https://www.osapublishing.org/abstract.cfm?uri=LS-2016-JW4A.10>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Nonperturbative nonlinear optics in liquid crystals

We show that reorientational nematic liquid crystals are an ideal workbench for the investigation of non-perturbative nonlinear optical effects and report light self-steering, power-controlled negative refraction and spontaneous symmetry breaking.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Physics, Research group: Nonlinear Optics, Research area: Optics, Univ Roma Tre, Roma Tre University, NooEL Nonlinear Opt & OptoElect Lab, University of Southampton, United Kingdom, Univ Porto, Universidade do Porto, Fac Ciencias, Ctr Fis Porto

Contributors: Alberucci, A., Piccardi, A., Kravets, N., Buchnev, O., Pannian, J. C., Assanto, G.

Publication date: 2016

#### Host publication information

Title of host publication: Laser science 2016  
Publisher: Optical Society of America (OSA)  
Article number: JW4A.12  
ISBN (Print): 978-1-943580-19-4  
URLs:

<https://www.osapublishing.org/abstract.cfm?uri=LS-2016-JW4A.12>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Improved properties for packaging materials by nanoscale surface modification and ALD barrier coating

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Materials Science, Research group: Paper Converting and Packaging, Metsä Board, Bemis, LUT Energy, Masaryk University

Contributors: Lahti, J., Lavonen, J., Lahtinen, K., Johansson, P., Seppänen, T., Cameron, D. C.

Number of pages: 23

Pages: 684-706

Publication date: 2016

#### Host publication information

Title of host publication: TAPPI International Conference on Nanotechnology for Renewable Materials 2016  
Volume: 2

Publisher: TAPPI Press

ISBN (Electronic): 9781510828001

ASJC Scopus subject areas: Biotechnology, Biomaterials, Materials Chemistry, Surfaces, Coatings and Films

URLs:

<http://www.scopus.com/inward/record.url?scp=84992694476&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84992694476

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **STACK assignments in university mathematics education**

Students' learning process can be assisted and diversified with the help of e-learning tools and virtual environments. In Tampere University of Technology, the aim is to utilize software that delivers assignments, checks students' answers and gives feedback to the students, in the mathematics courses. The software that has been used is called STACK, which can be integrated into Moodle. STACK assignments have been created as a part of the STEM education material bank Abacus.

Written feedback can be generated in STACK assignments as necessary. Feedback guides the students to identify their errors and revise them. It can also motivate the students to try again after giving a wrong answer.

This study concerns the use of STACK in TUT mathematics courses. Especially we are interested in

- how do the points gathered and the time of the last submission in STACK exercises correlate with the exam grades?
- when and for how long do the students solve the STACK assignments?
- how does the activity in STACK differ between honours and engineering mathematics students?

In STACK assignments, the students were able to give their answers in Moodle. For each lecture week, they had one week to solve and return the answers. All the student activity related to the STACK assignments was saved in the Moodle logs. Data was analysed with Matlab by the means of educational data mining.

We observed that the activity in STACK was the greatest near the deadline. We also found that, on average, the better the grade, the earlier the students gave their final answers in STACK. Additionally, the honours mathematics students made their submissions earlier: many of them considered STACK exercises as a good way to revise the subjects considered in the lectures, while engineering mathematics students mostly rehearsed with STACK near the deadline.

According to the survey polls, students found the STACK exercises as a nice and efficient way to rehearse and learn mathematics. Especially, the instant feedback was mostly appreciated. However, some of the students felt writing the answers with a computer unappealing, but generally this aspect was not considered a problem.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Mathematics, Research group: MAT Positioning

Contributors: Mäkelä, A., Ali-Löytty, S., Humaloja, J., Joutsenlahti, J., Kauhanen, J., Kaarakka, T.

Number of pages: 14

Publication date: 2016

### **Host publication information**

Title of host publication: Proceedings of the 44th SEFI Conference, 12 - 15 September 2016, Tampere, Finland

Publisher: European Society for Engineering Education SEFI

ISBN (Print): 9782873520144

ASJC Scopus subject areas: Education

Keywords: STACK, web-assisted learning tools

URLs:

[http://www.sefi.be/conference-2016/papers/Mathematics\\_and\\_Engineering\\_Education/makela-stack-assignments-in-university-mathematics-education-73\\_a.pdf](http://www.sefi.be/conference-2016/papers/Mathematics_and_Engineering_Education/makela-stack-assignments-in-university-mathematics-education-73_a.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Lean Software Design, Lean Education? Lessons from a Collaborative University-Industry Seminar**

In a rapidly developing field like software engineering, what is taught at the universities can fall behind from what is the status quo in the industry. Particularly in the professional activities related to user experience (UX) design, the students should gain experience in wide diversity of practical skills, ranging from fluent interaction with the customer and empathizing with the end users to creatively solving ill-defined problems and rapid prototyping. Even though the problem-based learning approach, hackathons, and other types of hands-on activities have become increasingly common in universities, educating user experience professionals demands specific practices. This paper presents a case study of collaborative teaching (Design Weekend)

between a university and industry, focusing on learning from the practices in the industry in an authentic project context. Design Weekend was an intensive 2-day hands-on seminar in which groups of students closely followed a Lean methodology that the collaborating digital agency has iteratively developed. The goals of the seminar were to provide a possibility for more hands-on learning of Lean and Design Thinking, including a customer organization with an authentic case, and to explore how well this kind of industry-oriented approach would fit in the curriculum of master and doctoral programs on UX.

The learning students' post-hoc learning diaries bring up rich insights about what was learned (ranging from personal development needs to various collaboration aspects and methodological insights) and how they perceive the applicability of the used methodology. The assessments of the seminar demonstrate interesting benefits compared to traditional project- and problem-based learning, such as realism and active customer involvement. Overall, based on this case study and subjective evaluations of the seminar, our teaching exploration can be concluded to show much promise. We report

the students' and teachers' perceived benefits as well as important aspects to consider in future implementations of similar seminars.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Pervasive Computing, Research area: User experience, Futurice Ltd., Pelastakaa Lapset ry - Save the Children Finland

Contributors: Olsson, T., Väättäjä, H., Ihamäki, H., Jaana, O., Länsisalo, M., Veera, U., Lehto-Lunden, T.

Publication date: 2016

#### Host publication information

Title of host publication: SEFI'16 - 44th Annual Conference of the European Society for Engineering Education

Publisher: European Society for Engineering Education SEFI

ISBN (Electronic): 9782873520144

Keywords: Learning outside the classroom, Problem-based learning, Informal learning,, University-Industry collaboration, , Problem-based learning

Electronic versions:

Olsson et al. SEFI 2016

URLs:

<http://urn.fi/URN:NBN:fi:tty-201709151887>

[http://sefibenvvh.cluster023.hosting.ovh.net/wp-content/uploads/2017/09/olsson-lean-software-design-lean-education-lessons-from-a-collaborative-university-industry-seminar-145\\_a.pdf](http://sefibenvvh.cluster023.hosting.ovh.net/wp-content/uploads/2017/09/olsson-lean-software-design-lean-education-lessons-from-a-collaborative-university-industry-seminar-145_a.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Moisture and building processes in Finland

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES

Contributors: Teriö, O., Hämäläinen, J., Uotila, U., Sorri, J., Saari, A.

Number of pages: 11

Pages: 907-917

Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the 20th CIB World Building Congress 2016: Volume I - Creating built environments of new opportunities. (Tampere University of Technology. Department of Civil Engineering. Construction Management and Economics. Report; Vol. 18).

Volume: I

Place of publication: Tampere

Publisher: Tampere University of Technology. Department of Civil Engineering

Editors: Kähkönen, K., Keinänen, M.

ISBN (Electronic): 978-952-15-3741-7

Keywords: construction site, drying, energy, heating, moisture

URLs:

[https://tutcris.tut.fi/portal/files/6186667/WBC16\\_Vol\\_1.pdf](https://tutcris.tut.fi/portal/files/6186667/WBC16_Vol_1.pdf)

#### Bibliographical note

INT=ark,"Hämäläinen, Jari"

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Agile methods in performance management system development process

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Cost Management Center, Managing digital industrial transformation (mDIT)

Contributors: Stormi, K., Laine, T., Korhonen, T.

Publication date: 2016

### Host publication information

Title of host publication: 10th Conference On New Directions In Management Accounting, Brussels, Belgium, December 14-16, 2016

URLs:

[http://www.eiasm.org/frontoffice/event\\_announcement.asp?event\\_id=1162#4483](http://www.eiasm.org/frontoffice/event_announcement.asp?event_id=1162#4483)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Visual narratives in the value chain of new management accounting knowledge

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Industrial Management, Research group: Cost Management Center

Contributors: Nyuppieva, E., Laine, T., Lyly-Yrjänäinen, J.

Publication date: 2016

#### Host publication information

Title of host publication: 10th Conference On New Directions In Management Accounting : Brussels, Belgium, December 14-16, 2016

URLs:

[http://www.eiasm.org/frontoffice/event\\_announcement.asp?event\\_id=1162#4483](http://www.eiasm.org/frontoffice/event_announcement.asp?event_id=1162#4483)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Site-controlled InAs Quantum Dots for Plasmonics

We present site-controlled epitaxy of InAs quantum dots (QD) for plasmonics and report QD-plasmon coupling in a hybrid structure consisting of site-controlled InAs/GaAs QD chains in the proximity of an Ag film.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Optoelectronics Research Centre, Research group: Semiconductor Technology and Applications,

Research group: Laboratory for Future Electronics, Department of Physics, Research group: Nanophotonics

Contributors: Hakkarainen, T., Tommila, J., Schramm, A., Simonen, J., Niemi, T., Strelow, C., Kipp, T., Kontio, J., Guina, M.

Publication date: 2016

#### Host publication information

Title of host publication: Conference on Lasers and Electro-Optics 2016 : QELS\_Fundamental Science

Publisher: OSA - The Optical Society

Article number: FM1B.3

ISBN (Electronic): 978-1-943580-11-8

ASJC Scopus subject areas: Condensed Matter Physics, Electronic, Optical and Magnetic Materials

Keywords: (250.5403) Plasmonics, (160.4236) Nanomaterials, (160.6000) Semiconductor materials

DOIs:

[10.1364/CLEO\\_QELS.2016.FM1B.3](https://doi.org/10.1364/CLEO_QELS.2016.FM1B.3)

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Back-calculation of the Saint-Alban A test embankment with a new modelling approach in LEM

To facilitate the continued use of limit equilibrium method (LEM) in stability design of embankments on soft clays, the new calculation method "Hybrid su" (HSU) has been developed. It is used to derive undrained shear strength from effective strength parameters, or to predict the excess pore pressure at failure. The HSU method uses an anisotropic effective stress soil model with volumetric hardening, from which a closed form solution for the effective mean stress at failure  $p_f$  is derived. This in turn is used to derive the anisotropic undrained shear strength (for use in total stress analyses), or excess pore pressure (for use in undrained effective stress analyses). The model accounts for factors such as anisotropy, consolidation state, volumetric hardening and to some extent, rate effects. An advantage of the model over traditional undrained effective stress calculations is that the overestimation of shear strength at  $F > 1$  is avoided.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Foundation Structures

Contributors: Lehtonen, V., Lämsivaara, T.

Number of pages: 9

Pages: 691-699  
Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the The 17th Nordic Geotechnical Meeting, Reykjavik Iceland : 25th - 28th of May 2016

ISBN (Electronic): 978-9935-24-002-6

URLs:

[http://www.ngm2016.com/uploads/2/1/7/9/21790806/076-024-ngm\\_2016\\_-\\_back-calculation\\_of\\_the\\_saint-alban\\_a\\_test\\_embankment\\_with\\_a\\_new\\_modelling\\_approach\\_in\\_lem\\_lehtonen\\_lansivaara.pdf](http://www.ngm2016.com/uploads/2/1/7/9/21790806/076-024-ngm_2016_-_back-calculation_of_the_saint-alban_a_test_embankment_with_a_new_modelling_approach_in_lem_lehtonen_lansivaara.pdf)

<http://www.ngm2016.com/>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### A mixed-integer linear programming approach for global discrete size optimization of frame structures

This paper proposes a method to solve discrete size optimization problems of frame structures to global optimality. Global optimality is guaranteed by reformulating the optimization problem as a mixed-integer linear program (MILP) and solving it with the branch-and-bound method. The presented mixed variable formulation extends the existing mixed variable formulation for size and topology optimization of truss structures. The MILP is obtained by adopting the simultaneous analysis and design approach. The variables consist of binary decision variables to select a profile section from the catalog, and state variables representing the member end forces. The equilibrium equations and member stiffness relations are included as constraints. The displacement and stress constraints are formulated such that for each member limit values are imposed at predefined locations along the member. The proposed method is applied to a three-bay three-story frame.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Metal and Light-wight structures, KU Leuven

Contributors: Van Mellaert, R., Mela, K., Tiainen, T., Heinisuo, M., Lombaert, G., Schevenels, M.

Number of pages: 14

Pages: 3395-3408

Publication date: 2016

#### Host publication information

Title of host publication: ECCOMAS Congress 2016 - Proceedings of the 7th European Congress on Computational Methods in Applied Sciences and Engineering : Crete; Greece; 5 June 2016 through 10 June 2016

Volume: 2

Publisher: National Technical University of Athens

ISBN (Electronic): 9786188284401

ASJC Scopus subject areas: Artificial Intelligence, Applied Mathematics

Keywords: Discrete optimization, Frame structures, Global optimization, Mixed-integer linear programs, Size optimization

URLs:

<http://www.scopus.com/inward/record.url?scp=84995387507&partnerID=8YFLogxK> (Link to publication in Scopus)

<https://www.eccomas2016.org/>

Source: Scopus

Source ID: 84995387507

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### How is it sustainable? Identifying key indicators for sustainable educational design

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering

Contributors: Sandström, N., Hytti, V., Nenonen, S., Lonka, K.

Number of pages: 3

Pages: 4217-4219

Publication date: 2016

#### Host publication information

Title of host publication: 10th INTED 2016 Conference Proceedings : 7-9 March, 2016, Valencia, Spain

Editors: Gómez Chova, L., López Martínez, A., Candel Torres, I.

ISBN (Electronic): 978-84-608-5617-7

### Publication series

Name: INTED proceedings

ISSN (Electronic): 2340-1079

Keywords: 516 Educational sciences

DOIs:

10.21125/inted.2016.2037

Source: Bibtex

Source ID: urn:6581b3d417d27c5477c844ae889e72da

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### Identifying and measuring customer value - case multi-locational worker

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Information Management and Logistics, Research group: Novi, Department of Civil Engineering

Contributors: Vasell, T., Vuolle, M., Petrulaitiene, V., Nenonen, S., Jylhä, T.

Number of pages: 9

Pages: 143-151

Publication date: 2016

#### Host publication information

Title of host publication: Research papers for EuroFM's 15th research symposium at EFMC2016 : 8-9 June 2016 in Milan, Italy

Publisher: EuroFM

Editors: Nielsen, S., Jensen, P. A.

ISBN (Electronic): 9788750211020

Keywords: facility management, Value co-creation, Customer experience, customer value measuring

URLs:

[http://orbit.dtu.dk/files/124939454/EFMC2016\\_proceeding.pdf](http://orbit.dtu.dk/files/124939454/EFMC2016_proceeding.pdf)

Source: Bibtex

Source ID: urn:3e8ad9e3f5cee371d9024be9db9d287f

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### New value chains to construction: advancing products and services

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research area: Construction Management and Economics, Research group: Digitalization in the real estate and construction sector, Research group: Capacity Development of Water and Environmental Services CADWES, Research group: Real estate development

Contributors: Virtanen, J., Hyypä, H., Stähle, P., Kallioikoski, S., Kähkönen, K. E., Ahlavuo, M., Launonen, P., Hyypä, J., Kukko, A., Julin, A.

Number of pages: 12

Pages: 954-965

Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the 20th CIB World Building Congress 2016 : Advancing products and services

Volume: V

Publisher: Tampere University of Technology. Department of Civil Engineering

Editor: Achour, N.

ISBN (Electronic): 978-952-15-3745-5

Keywords: value chain, additive manufacturing, 3D measuring, augmented reality, digitalization

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3745-5>

Source: Bibtex

Source ID: urn:a71b2e8aff713ed96c4a2301f007eb7b

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Towards responsive workspaces - identification of service paths for time-and-place independent work**

### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Civil Engineering  
Contributors: Petrulaitiene, V., Rytönen, E., Nenonen, S.  
Number of pages: 11  
Pages: 1141-1151  
Publication date: 2016

### **Host publication information**

Title of host publication: Proceedings of the 20th CIB World Building Congress 2016 : May 30 – June 3, 2016 Tampere Finland  
Volume: V  
Publisher: Tampere University of Technology  
Editor: Achour, N.  
ISBN (Electronic): 978-952-15-3745-5  
Keywords: workspace, services, framework, time-and-place independent work  
URLs:  
<http://urn.fi/URN:ISBN:978-952-15-3745-5>  
Source: Bibtex  
Source ID: urn:1d05ebdd695106100b0dcf2f1e35f399  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Campus retrofitting (CARE) methodology: a way to co-create future learning environments**

### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector  
Contributors: Nenonen, S., Eriksson, R., Niemi, O., Junghans, A., Nielsen, S. B., Lindahl, G.  
Number of pages: 12  
Pages: 738-749  
Publication date: 2016

### **Host publication information**

Title of host publication: Proceedings of the 20th CIB World Building Congress 2016 : May 30-June 3, 2016, Tampere, Finland  
ISBN (Electronic): 978-952-15-3742-4  
Keywords: Universities, Space management, Facilities management, Space design  
URLs:  
[http://orbit.dtu.dk/files/124058228/Nenonen\\_Eriksson\\_Niemi\\_Junghans\\_Nielsen\\_Lindahl.pdf](http://orbit.dtu.dk/files/124058228/Nenonen_Eriksson_Niemi_Junghans_Nielsen_Lindahl.pdf)  
<http://www.wbc16.com/wbc16/welcome.html>  
Source: Bibtex  
Source ID: urn:3d581eee21d4292b781da57acb1ad288  
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Single Shot Time Domain Ghost Imaging using Wavelength Multiplexing**

We report on the first demonstration of computational ghost imaging in the time domain using wavelength multiplexing. The wavelength-multiplexed Hadamard patterns used to probe a time-varying waveform enables image reconstruction in real time.

### **General information**

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Physics, Research area: Optics, Research group: Nonlinear Fiber Optics, Ita-Suomen yliopisto, Institut FEMTO-ST, UMR 6174 CNRS-Université de Franche-Comté  
Contributors: Ryczkowski, P., Barbier, M., Friberg, A. T., Dudley, J. M., Genty, G.  
Publication date: 2016

### **Host publication information**

Title of host publication: Frontiers in Optics 2016  
Publisher: Optical Society of America (OSA)

Article number: FTh5C.6  
ISBN (Electronic): 978-1-943580-19-4  
DOIs:

10.1364/FIO.2016.FTh5C.6

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Design and simulation of a thermal flow sensor for gravity-driven microfluidic applications**

Gravity-driven flow is an attractive approach to develop simpler microfluidic systems. Because clogged microchannels could easily lead to fatal operational failures, it is crucial to monitor flow rate in these systems. Therefore, we propose here for the first time a numerical model that combines a calorimetric flow sensor and a gravity-driven system. With the validated model, we studied the flow behavior in a gravity-driven system. Furthermore, we were able to improve the sensitivity of the measurement based on simulation results. This demonstrates, how the model could be used as an effective optimization tool in the gravity-driven system including calorimetric flow measurement.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Automation Science and Engineering, Research area: Microsystems, Research area: Measurement Technology and Process Control

Contributors: Mäki, A., Kontunen, A., Ryyänänen, T., Verho, J., Kreutzer, J., Leikkala, J., Kallio, P.

Number of pages: 5

Pages: 125-129

Publication date: 2016

#### **Host publication information**

Title of host publication: IEEE 11th Annual International Conference on Nano/Micro Engineered and Molecular Systems (NEMS)

Publisher: IEEE

ISBN (Electronic): 978-1-5090-1947-2

Keywords: Atmospheric modeling;Heating;Liquids;Microchannels;Reservoirs;Temperature measurement;Temperature sensors;calorimetric flow sensor;gravity-driven flow;modeling;numerical simulation

DOIs:

10.1109/NEMS.2016.7758214

URLs:

<http://ieeexplore.ieee.org/document/7758214/>

#### **Bibliographical note**

INT=ase,"Kontunen, Anton"

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Is languaging experienced to improve understanding of structural mechanics?**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Structural Mechanics

Contributors: Rundgren, A., Joutsenlahti, J., Mäkinen, J.

Publication date: 2016

#### **Host publication information**

Title of host publication: 44th SEFI 2016 Annual Conference : 12-15 September 2016 in Tampere, Finland

ISBN (Electronic): 9782873520144

URLs:

[http://www.sefi.be/conference-2016/papers/Engineering\\_Education\\_Research/rundgren-is-languaging-experienced-to-improve-understanding-141\\_a.pdf](http://www.sefi.be/conference-2016/papers/Engineering_Education_Research/rundgren-is-languaging-experienced-to-improve-understanding-141_a.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Learning for sustainable water and sanitation services**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Chemistry and Bioengineering



Contributors: Takala, A.  
Pages: 250-258  
Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the 8th International Conference on Engineering Education for Sustainable Development (Bruges, 4-7 September 2016) : Building a circular economy together  
Place of publication: Brugge  
Publisher: Instituut vóór Duurzame Ontwikkeling vzw  
Editor: Mazijn, B.  
Article number: D.3.2  
ISBN (Electronic): 978-90-903-0131-0  
URLs:

[http://instituutvoorduurzameontwikkeling.be/fileadmin/user\\_upload/eesd2016\\_proceedings.pdf](http://instituutvoorduurzameontwikkeling.be/fileadmin/user_upload/eesd2016_proceedings.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Control of Electric Vehicle Charging in Domestic Real Estates as Part of Demand Response Functionality

The paper discusses an electric vehicle (EV) charging control method enabling flexible high-power charging in domestic real estates. In the method, the charging current(s) of an EV is adjusted in accordance of the free capacity between maximum current limit and the non-EV load current(s). This kind of harging is simulated using long-lasting electricity consumption measurements and is also demonstrated with a real commercial charging station and an EV. The simulations and the real world demonstration show that the method works well and is very flexible. However, if it is widely used, its impacts on distribution grids are not favorable from distribution system operator (DSO) point-of-view. Power based distribution tariffs, which are nowadays under active consideration by Finnish DSOs, could cope with this problem.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Electrical Engineering, Research area: Power engineering, Lappeenranta University of Technology  
Contributors: Rautiainen, A., Lummi, K., Järventausta, P., Tikka, V., Lana, A.  
Publication date: 2016

#### Host publication information

Title of host publication: Cired Workshop 2016  
Article number: 0240  
ISBN (Electronic): 978-1-78561-202-2  
URLs:

[http://www.cired.net/publications/workshop2016/pdfs/CIRED2016\\_0240\\_final.pdf](http://www.cired.net/publications/workshop2016/pdfs/CIRED2016_0240_final.pdf)

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

#### Roadmap towards the vision of the future power system and electricity market

This paper reports the results of the Finnish national project "Roadmap 2025" which had two main objectives. The first one was to clarify the long term vision (up to 2035) of the power system and electricity market, and the second one was to create a roadmap, a development path towards the vision. The project was partially an update of the project "Vision of the Power System 2030", reported at CIRED 2007. However, instead of focusing only on technological issues, the project also included electricity market and service market perspectives and emphasized the necessary actions needed in changing the present system into the system of the future. The main results can be summarized as follows: Challenges of the future flexible power system which will be achieved by strong transmission network, cross-border grid connections, automation, undergrounding of MV and LV networks, microgrids, controllable loads, energy storages and renewable energy.

#### General information

Publication status: Published  
MoE publication type: A4 Article in a conference publication  
Organisations: Department of Electrical Engineering, Research area: Power engineering, University of Vaasa (UVA), Department of Chemistry and Bioengineering, Lappeenranta University of Technology, Oy Merinova Ab  
Contributors: Kumpulainen, L., Kauhaniemi, K., Repo, S., Valkealahti, S., Honkapuro, S., Partanen, J., Koivisto-Rasmussen, R., Järventausta, P.  
Publication date: 2016

#### Host publication information

Title of host publication: CIRED Workshop 2016  
Publisher: Institution of Engineering and Technology  
ISBN (Electronic): 978-1-78561-202-2  
ASJC Scopus subject areas: Electrical and Electronic Engineering

DOIs:

10.1049/cp.2016.0690

Source: Scopus

Source ID: 85007529978

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Mining smart meter data - Case Finland**

Smart meters collect a lot of data on customer level electricity consumption and this, together with other data sources e.g. environmental information and public open data, provides an excellent basis for data mining. As a part of a recent smart grid project conducted in Finland, several different ways of mining smart meter data were studied. The project brought advances in customer classification and clustering, load profiling, spatial load analytics, behaviour change detection and load forecasting.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering, Ita-Suomen yliopisto

Contributors: Mutanen, A., Niska, H., Järventausta, P.

Publication date: 2016

### **Host publication information**

Title of host publication: CIRED Workshop 2016

Publisher: Institution of Engineering and Technology

ISBN (Print): 978-1-78561-202-2

ASJC Scopus subject areas: Electrical and Electronic Engineering

Electronic versions:

CIRED2016\_0120\_final

DOIs:

10.1049/cp.2016.0776

URLs:

<http://urn.fi/URN:NBN:fi:ty-201809252340>

Source: Scopus

Source ID: 85007521225

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Profitability of different li-ion batteries as back-up power in LVDC distribution network**

This paper studies the profitability of different lithiumion batteries as back-up power in low voltage direct current (LVDC) network. Battery energy storage can prevent part of interruptions in LVDC network that happen due to failures in medium voltage (MV) network. In the present Finnish regulation model avoiding customer interruptions directly affects distribution network operator's profits by decreasing quality of supply deductions that are used in reasonable return calculations. LVDC technology provides a cost-efficient alternative for replacing low-loaded MV branches of the electricity distribution network. Benefits of LVDC are large power transfer capacity with low voltage, cost saving potential and improvements to reliability and voltage quality [1]. Elenia Oy has had pilot implementations already many years with promising results [2]. The key finding of the paper is that using battery energy storages to avoid customer interruption cost can be financially feasible in many medium voltage branches when the interruption frequency per branch is taken into account and the battery size is optimised based on the power requirement of the branch.

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering, Elenia Oy

Contributors: Markkula, J., Vilppo, O., Järventausta, P., Hakala, T., Lähdeaho, T.

Publication date: 2016

### **Host publication information**

Title of host publication: CIRED Workshop 2016

ISBN (Print): 978-1-78561-202-2

ASJC Scopus subject areas: Electrical and Electronic Engineering

DOIs:

10.1049/cp.2016.0787

URLs:

[http://www.cired.net/publications/workshop2016/pdfs/CIRED2016\\_0253\\_final.pdf](http://www.cired.net/publications/workshop2016/pdfs/CIRED2016_0253_final.pdf)

Source: Scopus

Source ID: 85007564317

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Negotiating water governance: towards cooperation in contentious groundwater recharge projects**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering

Contributors: Kurki, V.

Pages: 91-102

Publication date: 2016

#### **Host publication information**

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume I - Creating built environments of new opportunities

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3741-7

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3741-7>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Role of Power and Sense Making in the Briefing of a Small Renovation Project**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research area: Construction Management and Economics, Research group: Digitalization in the real estate and construction sector

Contributors: Naaranoja, M., Kähkönen, K., Keinänen, M.

Pages: 611-621

Publication date: 2016

#### **Host publication information**

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume I - Creating built environments of new opportunities

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3741-7

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3741-7>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **The Workplace for Researchers – Enhancing Concentration and Face-to-face Interaction**

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering

Contributors: Huhtelin, M., Nenonen, S.

Pages: 753-764

Publication date: 2016

#### **Host publication information**

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume I - Creating built environments of new opportunities

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3741-7

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3741-7>

#### **Bibliographical note**

INT=rak,"Huhtelin, Mervi"

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Empowerment in construction: a qualitative analysis of subcontractors' quality assurance**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES

Contributors: Viita, J., Junnonen, J.

Pages: 436-448

Publication date: 2016

### **Host publication information**

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume II - Environmental Opportunities and Challenges. Constructing Commitment and Acknowledging Human Experiences

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3742-4

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3742-4>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Perspective of Social Usability in the Change Processes of an Academic Workplace**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering

Contributors: Kostiaainen, E., Nenonen, S.

Pages: 688-701

Publication date: 2016

### **Host publication information**

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume II - Environmental Opportunities and Challenges. Constructing Commitment and Acknowledging Human Experiences

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3742-4

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3742-4>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Spatial borders and affordances of a temporary school building – Enhancing the school engagement and learning experience**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering

Contributors: Airo, K., Vaara, L., Nenonen, S.

Pages: 715-725

Publication date: 2016

### **Host publication information**

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume II - Environmental Opportunities and Challenges. Constructing Commitment and Acknowledging Human Experiences

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3742-4

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3742-4>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## **Reinforcement Corrosion Modelling in Renovation Strategy for Concrete Facades**

### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures

Contributors: Köliö, A., Lahdensivu, J., Pentti, M.

Pages: 199-211

Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume III - Building Up Business Operations and Their Logic. Shaping Materials and Technologies

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3743-1

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3743-1>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Resource – Space Charts for Construction Workspace Scheduling

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering, Research area: Construction Management and Economics, Research group: Digitalization in the real estate and construction sector, Research group: Capacity Development of Water and Environmental Services CADWES, Research group: Real estate development

Contributors: Bragadin, M. A., Kähkönen, K.

Pages: 677-688

Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume III - Building Up Business Operations and Their Logic. Shaping Materials and Technologies

Publisher: Tampere University of Technology. Department of Civil Engineering

ISBN (Electronic): 978-952-15-3743-1

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3743-1>

#### Bibliographical note

EXT="Bragadin, Marco A."

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### Role of Water Cooperatives in Water Service Production - Lessons from Finland and Denmark

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Civil Engineering

Contributors: Pietilä, P., Arvonen, V., Katko, T.

Pages: 1152-1161

Publication date: 2016

#### Host publication information

Title of host publication: Proceedings of the 20th CIB World Building Congress 2016 : May 30 – June 3, 2016 Tampere Finland

Volume: V

Publisher: Tampere University of Technology

Editor: Achour, N.

ISBN (Electronic): 978-952-15-3745-5

URLs:

<http://urn.fi/URN:ISBN:978-952-15-3745-5>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### A trial of yoking-proof protocol in RFID-based smart-home environment

Owing to significant progress in the Internet of Things (IoT) within both academia and industry, this breakthrough technology is increasingly penetrating our everyday lives. However, the levels of user adoption and business revenue are

still lagging behind the original expectations. The reasons include strong security and privacy concerns behind the IoT, which become critically important in the smart home environment. Our envisioned smart home scenario comprises a variety of sensors, actuators, and end-user devices interacting and sharing data securely. Correspondingly, we aim at investigating and verifying in practice the Yoking-proof protocol, which is a multi-factor authentication solution for smart home systems with an emphasis on data confidentiality and mutual authentication. Our international team conducted a large trial featuring the Yoking-proof protocol, RFID technology, as well as various sensors and user terminals. This paper outlines the essentials of this trial, reports on our practical experience, and summarizes the main lessons learned.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Research group: Emerging Technologies for Nano-Bio-Info-Cogno, Electronics and Communications Engineering, St. Petersburg State University of Aerospace Instrumentation, Brno University of Technology

Contributors: Prudanov, A., Tkachev, S., Golos, N., Masek, P., Hosek, J., Fujdiak, R., Zeman, K., Ometov, A., Bezzateev, S., Voloshina, N., Andreev, S., Misurec, J.

Number of pages: 10

Pages: 25-34

Publication date: 2016

#### **Host publication information**

Title of host publication: Distributed Computer and Communication Networks - 19th International Conference, DCCN 2016, Revised Selected Papers

Volume: 678

Publisher: Springer Verlag

ISBN (Print): 9783319519166

#### **Publication series**

Name: Communications in Computer and Information Science

Volume: 678

ISSN (Print): 1865-0929

ASJC Scopus subject areas: Computer Science(all)

Keywords: Authentication, IoT, RFID, Smart-Home, Yoking-proof protocol

DOIs:

10.1007/978-3-319-51917-3\_3

Source: Scopus

Source ID: 85013436263

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### **How to benefit from learning logs in engineering education?**

##### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Mechanical Engineering and Industrial Systems, Research area: Design, Development and LCM, MEI Laboratory, Ita-Suomen yliopisto

Contributors: Juuti, T., Kopra, M. J., Rättyä, K., Lehtonen, T.

Publication date: 2016

##### **Host publication information**

Title of host publication: 44th Annual Conference of the European Society for Engineering Education - Engineering Education on Top of the World: Industry-University Cooperation, SEFI 2016

Publisher: European Society for Engineering Education SEFI

ISBN (Electronic): 9782873520144

ASJC Scopus subject areas: Engineering(all), Education

URLs:

[http://www.sefi.be/conference-2016/papers/Engineering\\_Education\\_Research\\_\\_Engineering\\_Skills/juuti-learning-logs-and-reflecting-in-engineering-education-39\\_a.pdf](http://www.sefi.be/conference-2016/papers/Engineering_Education_Research__Engineering_Skills/juuti-learning-logs-and-reflecting-in-engineering-education-39_a.pdf)

URLs:

<http://www.scopus.com/inward/record.url?scp=85014063424&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 85014063424

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Leadership instead of grading - The new goals of assessment

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Mechanical Engineering and Industrial Systems, Research area: Design, Development and LCM, MEI Laboratory, Ita-Suomen yliopisto

Contributors: Lehtonen, T., Juuti, T., Vanhatalo, M., Kopra, M. J., Rättyä, K.

Number of pages: 8

Publication date: 2016

### Host publication information

Title of host publication: 44th Annual Conference of the European Society for Engineering Education - Engineering Education on Top of the World: Industry-University Cooperation, SEFI 2016

Publisher: European Society for Engineering Education SEFI

ISBN (Electronic): 9782873520144

ASJC Scopus subject areas: Engineering(all), Education

Keywords: Assessment, Lifelong learning, Situational leadership

URLs:

[http://www.sefi.be/conference-2016/papers/Sustainability\\_and\\_Engineering\\_Education/lehtonen-from-grading-towards-leadership--new-goals-for-assessment-55\\_a.pdf](http://www.sefi.be/conference-2016/papers/Sustainability_and_Engineering_Education/lehtonen-from-grading-towards-leadership--new-goals-for-assessment-55_a.pdf)

Source: Scopus

Source ID: 85014096858

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## Educating future coders with a holistic ICT curriculum and new learning solutions

Technology-orientation and coding are gaining momentum in Finnish curriculum planning for primary and secondary school. However, according to the existing plans, the scope of ICT teaching is limited to practical topics, e.g., how to drill basic control structures (if-then-else, for, while) without focusing on the high level epistemological view of ICT. This paper proposes some key extensions to such plans, targeted to highlight rather the epistemological factors of teaching than talk about concrete means of strengthening the craftsmanship of coding. The proposed approach stems from the qualitative data collected by interviewing ICT professionals (N=7, 4 males, 3 females), who have gained experience of the industry needs while working as ICT professionals (avg=11.3 y, s=3.9 y). This work illustrates a holistic model of ICT teaching as well as suggests a set of new methods and tools.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pervasive Computing, Research area: Software engineering, Rovio, Jyväskylän yliopisto

Contributors: Niemelä, P., Di Flora, C., Helevirta, M., Isomöttönen, V.

Number of pages: 5

Pages: 132-136

Publication date: 2016

### Host publication information

Title of host publication: 7th International Multi-Conference on Complexity, Informatics and Cybernetics, IMCIC 2016 and 7th International Conference on Society and Information Technologies, ICSIT 2016

Volume: 2

Publisher: IIIS

ISBN (Electronic): 9781941763384

ASJC Scopus subject areas: Artificial Intelligence, Information Systems, Computer Networks and Communications

Keywords: Concept maps, Holistic ICT model, ICT curriculum, Modelling, Teaching ICT in primary and secondary school

URLs:

<http://www.iiis.org/CDs2016/CD2016Spring/papers/EB259QT.pdf>

Source: Scopus

Source ID: 85032963441

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

## HVS-based local analysis of denoising efficiency for DCT-based filters

Images acquired and processed in communication and multimedia systems are often noisy. Thus, pre-filtering is a typical stage to remove noise. At this stage, a special attention has to be paid to image visual quality. This paper analyzes denoising efficiency from the viewpoint of visual quality improvement using metrics that take into account human vision system (HVS). Specific features of the paper consist in, first, considering filters based on discrete cosine transform (DCT) and, second, analyzing the filter performance locally. Such an analysis is possible due to the structure and peculiarities of the metric PSNR-HVS-M. It is shown that a more advanced DCT-based filter BM3D outperforms a simpler (and faster)

conventional DCT-based filter in locally active regions, i.e., neighborhoods of edges and small-sized objects. This conclusions allows accelerating BM3D filter and can be used in further improvement of the analyzed denoising techniques.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Signal Processing, Research group: Algebraic and Algorithmic Methods in Signal Processing AAMSP, Research group: Computational Imaging-CI, Signal Processing Research Community (SPRC)

Contributors: Rubel, O., Ponomarenko, N., Lukin, V., Astola, J., Egiazarian, K.

Number of pages: 4

Pages: 189-192

Publication date: 14 Dec 2015

#### Host publication information

Title of host publication: 2015 2nd International Scientific-Practical Conference Problems of Infocommunications Science and Technology, PIC S and T 2015 - Conference Proceedings

Publisher: IEEE

ISBN (Print): 9789669751928

ASJC Scopus subject areas: Computer Science (miscellaneous), Computer Science Applications

Keywords: DCT-based filters, HVS-metrics, image denoising, local analysis

DOIs:

10.1109/INFOCOMMST.2015.7357309

Source: Scopus

Source ID: 84962840358

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Method of data compression for traffic monitoring

In this paper a problem of compressing data containing information on basic parameters of network traffic is considered. Six test sets with different types of network traffic for known monitoring tool Wireshark are formed. Analysis of compression efficiency for these datasets by widely used archivers is carried out. It is shown that the main part of memory in compressed data relates to timestamps. A method for compressing timestamps that consists in delta calculation, Burrows-Wheeler transform (BWT), distance coding (DC) and recursive group coding (RGC) at the final stage is proposed. It is demonstrated that the use of RGC at the final stage provides more efficient coding compared to known methods. It is also shown that the proposed method of timestamps coding produces about twice larger compression ratio than WinRar.

#### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Signal Processing, Research group: Algebraic and Algorithmic Methods in Signal Processing AAMSP, Research group: Computational Imaging-CI, Signal Processing Research Community (SPRC)

Contributors: Kozhemiakina, N., Lukin, V., Ponomarenko, N., Akulynichev, A., Astola, J., Egiazarian, K.

Number of pages: 4

Pages: 153-156

Publication date: 14 Dec 2015

#### Host publication information

Title of host publication: 2015 2nd International Scientific-Practical Conference Problems of Infocommunications Science and Technology, PIC S and T 2015 - Conference Proceedings

Publisher: IEEE

ISBN (Print): 9789669751928

ASJC Scopus subject areas: Computer Science (miscellaneous), Computer Science Applications

Keywords: Burrows-Wheeler transform, data compression, distance coding, traffic monitoring and analysis tools

DOIs:

10.1109/INFOCOMMST.2015.7357299

Source: Scopus

Source ID: 84962870220

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

#### Bispectrum-based demodulation technique using triple-channel heterodyning of triplet-signal

Paper is dedicated to novel bispectrum-based demodulation technique by using triple-channel heterodyning of triplet-signals. Test statistics used for triplet-signals detection and discrimination are evaluated in the form of the bimagnitude peak values. Experimental study of noise immunity in bispectrum-based digital communication system is performed for suggested triple-channel heterodyning technique. Bit error rate (BER) values are computed under additive Gaussian noise influence in radio communication link for wide variations of input signal-to-noise ratio (SNR).



### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Signal Processing, Research group: Algebraic and Algorithmic Methods in Signal Processing AAMSP, Signal Processing Research Community (SPRC), National Aerospace University

Contributors: Naumenko, V., Solodovnik, V., Totsky, A., Zelensky, A., Astola, J.

Number of pages: 3

Pages: 224-226

Publication date: 14 Dec 2015

### Host publication information

Title of host publication: 2015 Second International Scientific-Practical Conference Problems of Infocommunications Science and Technology (PIC S&T)

Publisher: IEEE

ISBN (Print): 9789669751928

ASJC Scopus subject areas: Computer Science (miscellaneous), Computer Science Applications

Keywords: bispectrum, digital communication system, noise immunity, three-channel heterodyning, triplet-signal

DOIs:

10.1109/INFOCOMMST.2015.7357319

Source: Scopus

Source ID: 84962840376

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## Platform Competences to Enhance Network Effects in Business Ecosystems

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Pori Department, Research group: Business Ecosystems, Networks and Innovations, Queensland University of Technology QUT, VTT Technical Research Centre of Finland

Contributors: Seppänen, M., Dedehayir, O., Still, K., Valkokari, K., Suominen, A.

Publication date: 8 Dec 2015

### Host publication information

Title of host publication: 2015 ISPIM Innovation Summit in Brisbane, Australia - 6-9 December 2015

Publisher: International Society for Professional Innovation Management ISPIM

ISBN (Electronic): 978-1-911136-00-2

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## MYSTERY SHOPPERS RECOGNISING KNOWLEDGE SHARING BARRIERS IN HIGHER EDUCATION

This study focuses on the knowledge sharing barriers in the space between learning and teaching in higher education as reported by mystery shoppers. There is surprisingly little context-specific research on learning and teaching in a knowledge intensive community like a university from the perspective of knowledge management (KM). Discussing learning and teaching within KM is based on considering students controversially as customers or stakeholders. Thus including them more meaningfully in assessing and developing teaching practices, or knowledge flow, seems justified. The specific aim of this paper is to first recognise possible knowledge sharing barriers and then categorize such barriers emerging from the material into three larger domains, namely, individual barriers, technological barriers and organisational barriers.

There were 45 students from all faculties participating in a mystery shopper project in a Finnish university of technology. They observed their learning experience for six weeks in order to supplement data from other sources, to add a student voice on the process of developing learning and teaching in higher education.

The research approach represents qualitative content analysis in which knowledge-sharing barriers were recognised from the qualitative mystery shopper data. The results identify teaching practises that contribute to creating knowledge sharing barriers. More detailed and almost real-time contextual activity sampling is suggested as a method for further study and also an avenue for instant feedback for teaching staff. The results will provide data on current knowledge practices and learning processes in a technical university in Finland.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Language Centre, Department of Information Management and Logistics, Research group: Novi, University of Tampere

Contributors: Tukiainen, M., Helander, N., Mäkinen, M.

Publication date: 16 Nov 2015

### Host publication information

Title of host publication: ICERI2015 Proceedings : 8th annual International Conference of Education, Research and Innovation Seville (Spain). 16th - 18th of November, 2015.

ISBN (Electronic): 978-84-608-2657-6

URLs:

<https://iased.org/iceri/>

### Bibliographical note

ORG=kie,0.5

ORG=tlo,0.5

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## University Students' Perceptions of Academic Writing: An Academic Literacies Perspective

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Language Centre, Department of Information Management and Logistics, Research group: Novi, University of Tampere

Contributors: Tukiainen, M., Mäkinen, M., Helander, N.

Number of pages: 7

Pages: 7589-7595

Publication date: 16 Nov 2015

### Host publication information

Title of host publication: ICERI2015 Proceedings : 8th annual International Conference of Education, Research and Innovation Seville (Spain). 16th - 18th of November, 2015.

ISBN (Electronic): 978-84-608-2657-6

URLs:

<https://iased.org/iceri/>

### Bibliographical note

ORG=kie,0.5

ORG=tlo,0.5

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

## A NLOS-robust TOA positioning filter based on a skew-t measurement noise model

A skew-t variational Bayes filter (STVBF) is applied to indoor positioning with time-of-arrival (TOA) based distance measurements and pedestrian dead reckoning (PDR). The proposed filter accommodates large positive outliers caused by occasional non-line-of-sight (NLOS) conditions by using a skew-t model of measurement errors. Real-data tests using the fusion of inertial sensors based PDR and ultra-wideband based TOA ranging show that the STVBF clearly outperforms the extended Kalman filter (EKF) in positioning accuracy with the computational complexity about three times that of the EKF.

### General information

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Automation Science and Engineering, Research group: Positioning, Wireless Communications and Positioning (WICO)

Contributors: Nurminen, H., Ardeshiri, T., Piche, R., Gustafsson, F.

Number of pages: 7

Pages: 1-7

Publication date: 1 Oct 2015

### Host publication information

Title of host publication: 2015 International Conference on Indoor Positioning and Indoor Navigation (IPIN)

Publisher: IEEE

ISBN (Print): 978-1-4673-8402-5

Keywords: Approximation methods, Computational modeling, Distance measurement, Gaussian distribution, Measurement errors, Noise measurement, Position measurement, NLOS, TOA, UWB, indoor positioning, robust filtering, skew t, skewness, variational Bayes

Electronic versions:

IPIN2015\_postprint

DOIs:

10.1109/IPIN.2015.7346786

URLs:

<http://urn.fi/URN:NBN:fi:tty-201603183702>

Source: Bibtex

Source ID: urn:e960458d3c3e7f01508ed799f1fbe96d

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Direct Laser Writing of Fluorescent Silver Nanoclusters in Polyvinyl Alcohol Films**

We demonstrate successful fabrication of fluorescent microstructures by direct laser writing of silver nanoclusters in polyvinyl alcohol films using a cost-effective laser diode. The nanoclusters show very good photostability in the widely used polymer material.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Physics, Research area: Optics, Research group: Nonlinear Optics, Research group: Applied Optics, Frontier Photonics

Contributors: Karimi, N., Kunwar, P., Toivonen, J.

Publication date: Oct 2015

#### **Host publication information**

Title of host publication: Frontiers in Optics 2015 : Proceedings

Article number: FTu5E.4

ISBN (Electronic): 978-1-943580-03-3

ASJC Scopus subject areas: Physics and Astronomy(all)

Keywords: Optical data storage, Microstructure fabrication, Fluorescence, laser-induced

DOIs:

10.1364/FIO.2015.FTu5E.4

URLs:

<https://www.osapublishing.org/abstract.cfm?uri=FIO-2015-FTu5E.4>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Development of a Low-Cost Fuzzy Gain Schedule Neutralization Control System**

This paper has focused on the development of a Low-Cost Fuzzy Gain Schedule Neutralization Control System. The system dynamics has been identified for different operational conditions. The implementation and instrumentation of a typical Neutralization System using low cost elements, with an appropriate monitoring, control and data acquisition of the process variables has been successfully implemented, as well as the Fuzzy Gain Schedule pH neutralization controller. As inputs it has been used the Auxiliary Variable, defined with the linguist terms as Acid, Neutral and Alkaline by three trapezoidal membership functions, as well as the control error and the change in the control error, both defined by five triangular membership functions. The controller outputs were defined for the Acid and Alkali pumps by 18 triangular membership functions and it was defined a set of 50 fuzzy rules. The development of the control system considered in this paper reveals an attractive industrial application perspective, representing a potential application for water consumption reduction in industry, based on low cost elements.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Automation Science and Engineering, University of Campinas, Federal University of Uberlândia

Contributors: Sislian, R., Da Silva, F. V., Gedraite, R., Jokinen, H., An, D. K. R.

Number of pages: 4

Pages: 575-578

Publication date: Oct 2015

#### **Host publication information**

Title of host publication: WCECS 2015 - World Congress on Engineering and Computer Science 2015

Volume: II

Publisher: Newswood Limited

ISBN (Electronic): 9789881404725

#### **Publication series**

Name: Lecture Notes in Engineering and Computer Science

Volume: 2220

ISSN (Electronic): 2078-0966

ASJC Scopus subject areas: Computer Science (miscellaneous)

Keywords: Fuzzy control, Neutralization, Water consumption reduction

URLs:

[http://www.iaeng.org/publication/WCECS2015/WCECS2015\\_pp575-578.pdf](http://www.iaeng.org/publication/WCECS2015/WCECS2015_pp575-578.pdf)

Source: Scopus

Source ID: 84992694500

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **Benchmarking of Factory Level ESD Control**

A standard compliance of the factory level ESD control varies between organizations. We have audited twelve different factories during the 24-month benchmarking period. These audits were focused on the ESD control programs and the process control. The summary of results and examples of the best practices are presented in this paper.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, ABB Oy, Drives, Nokia Corporation, Cascade Metrology

Contributors: Viheriäkoski, T., Kohtamäki, J., Peltoniemi, T., Tamminen, P.

Number of pages: 7

Publication date: 27 Sep 2015

#### **Host publication information**

Title of host publication: Electrical Overstress/Electrostatic Discharge Symposium Proceedings 2015

Volume: 2015

Place of publication: USA

Publisher: IEEE COMPUTER SOC

Article number: 6B.1

ISBN (Print): 9781479988952

ASJC Scopus subject areas: Engineering(all)

Keywords: Surface Resistivity, dissipative material, measurement

Electronic versions:

PID3769119

DOIs:

10.1109/EOSESD.2015.7314769

URLs:

<http://urn.fi/URN:NBN:fi:tty-201603013595>

Research output: Chapter in Book/Report/Conference proceeding > Conference contribution > Scientific > peer-review

### **The effect of USB ground cable and product dynamic capacitance on IEC61000-4-2 qualification**

EC61000-4-2 discharge stress levels are studied with varying product capacitance and ground connections. Stress levels are evaluated based on the measured and simulated peak current, peak power, pulse rise time, and energy transfer along to the USB cable. These stress parameters can be significantly affected by adjusting the test setup.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Sensing Systems for Wireless Medicine (MediSense), Department of Electronics and Communications Engineering, Research group: Wireless Identification and Sensing Systems Research Group

Contributors: Tamminen, P., Ukkonen, L., Sydänheimo, L.

Number of pages: 10

Publication date: 27 Sep 2015

#### **Host publication information**

Title of host publication: Electrical Overstress / Electrostatic Discharge Symposium Proceedings 2015

Volume: 2015

Place of publication: USA

Publisher: IEEE COMPUTER SOC

Article number: 7B.2

ISBN (Print): 9781479988952

ASJC Scopus subject areas: Engineering(all)

Keywords: USB, IEC61000-4-2, ESD, EMC, cable

Electronic versions:

7B2\_Tamminen

DOIs:

10.1109/EOSESD.2015.7314766

URLs:

<http://urn.fi/URN:NBN:fi:tty-201603013600>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Uncertainties in Charge Measurements of ESD Risk Assessment**

Charge measurement techniques are often considered too complicated to the process control of electronics manufacturing. In his study, we show that expensive instrumentation is not necessarily needed for characterizing ESD source parameters in a risk assessment. Measurement can be made accurately when uncertainties are properly taken into account.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, ABB Oy, Drives, Cascade Metrology, Nokia Corporation

Contributors: Viheriäkoski, T., Kohtamäki, J., Peltoniemi, T., Tamminen, P.

Number of pages: 8

Publication date: 27 Sep 2015

#### **Host publication information**

Title of host publication: Electrical Overstress / Electrostatic Discharge Symposium Proceedings 2015

Volume: 2015

Place of publication: USA

Publisher: IEEE COMPUTER SOC

Article number: 6B.3

ISBN (Print): 9781479988952

ASJC Scopus subject areas: Engineering(all)

Keywords: ESD, charge, measurement, Uncertainty estimation

Electronic versions:

PID3768707

DOIs:

10.1109/EOSESD.2015.7314802

URLs:

<http://urn.fi/URN:NBN:fi:tty-201603013596>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **ESD and Disturbance Cases in Electrostatic Protected Areas**

Electrostatic protected area (EPA) can effectively prevent ESD failures from charged operators, work benches and tools. However, electrical disturbances and ESD events from other sources can still exist in well-built EPAs. In this paper failures found in electronic assembly environments are analyzed to improve coverage of ESD control programs.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Sensing Systems for Wireless Medicine (MediSense), Department of Electronics and Communications Engineering, Research group: Wireless Identification and Sensing Systems Research Group, Cascade Metrology

Contributors: Tamminen, P., Viheriäkoski, T., Ukkonen, L., Sydänheimo, L.

Number of pages: 7

Publication date: 27 Sep 2015

#### **Host publication information**

Title of host publication: Electrical Overstress / Electrostatic Discharge Symposium Proceedings 2015

Volume: 2015

Place of publication: USA

Publisher: IEEE COMPUTER SOC

Article number: 5B.2

ISBN (Print): 9781479988952

ASJC Scopus subject areas: Engineering(all)

Keywords: EPA, ESD, DISTURBANCES, EMI, failure

Electronic versions:

5B.2\_Tamminen\_2015

DOIs:

10.1109/EOESD.2015.7314792

URLs:

<http://urn.fi/URN:NBN:fi:tty-201603013599>

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Circularly Polarized Textile Antenna For 2.45 GHz**

This paper presents a circularly polarized antenna on thin and flexible Denim substrate for Industrial, Scientific and Medical (ISM) band and Wireless Body Area Network (WBAN) applications at 2.45 GHz. Copper tape is used as the conductive material on 1 mm thick Denim substrate. Circular polarization is achieved by introducing rectangular slot along diagonal axes at the center of the circular patch radiator. Bandwidth enhancement is done using partial and slotted ground plane. The measured impedance bandwidth of the proposed antenna is 6.4 % (2.42 GHz to 2.58 GHz) or 160 MHz. The antenna exhibits good radiation characteristics with gain of 2.25 dB. Simulated and measured results are presented to validate the operability of antenna within the proposed frequency bands.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electronics and Communications Engineering, Research group: Wireless Identification and Sensing Systems Research Group, Sensing Systems for Wireless Medicine (MediSense), Department of Electrical Engineering, University of California, Los Angeles, California, USA

Contributors: Rizwan, M., Rahmat-Samii, Y., Ukkonen, L.

Number of pages: 2

Pages: 51-52

Publication date: 21 Sep 2015

#### **Host publication information**

Title of host publication: Circularly Polarized Textile Antenna For 2.45 GHz

Publisher: IEEE

ISBN (Electronic): 978-1-4799-8543-2

Keywords: Denim, Industrial, Scientific and Medical (ISM) band, Wireless Body Area Network (WBAN), Textile antenna, Circular Polarization

DOIs:

10.1109/IMWS-BIO.2015.7303755

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Compensation of PV generator output power fluctuations with energy storage systems**

Photovoltaic generators (PVG) suffer from short-term intermittency of output power. With significant penetration of PV this intermittency can lead to power systems instability and power quality problems. Energy storage systems (ESS) can be used to compensate PV power fluctuations in order to mitigate these problems. In this paper ESS behavior, control and sizing have been investigated to mitigate instabilities caused by PV power plants operating in Northern European conditions through simulations that utilize measurements from the Tampere University of Technology (TUT) Solar PV power station research plant. Continuous synchronized measurements have been recorded with the irradiance and PV module temperature sensor network with a 10 Hz sampling frequency since June 2011. The ESS capacity and power requirements are derived from the simulations for different PVG sizes and PV power ramp rate (RR) limits. The results show how both capacity and power requirements decrease as functions of the RR limit and the PVG size. Also, interesting differences have been noticed compared to similar studies done in Southern European climate, which indicate that the operational climate of the PVG can have an effect on ESS sizing.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering, Tampere University of Technology

Contributors: Schnabel, J., Valkealahti, S.

Number of pages: 5

Pages: 2177-2181

Publication date: 14 Sep 2015

#### **Host publication information**

Title of host publication: 31st European Photovoltaic Solar Energy Conference and Exhibition (31st EU PVSEC), 14– 18 September, 2015, Hamburg, Germany

ISBN (Print): 3-936338-39-6

ASJC Scopus subject areas: Energy(all)

DOIs:

10.4229/EUPVSEC20152015-5BV.2.6

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Recognition of shading events caused by moving clouds and determination of shadow velocity from solar radiation measurements**

Fast variability of solar radiation is the main cause of fluctuating photovoltaic (PV) power production and shadows caused by overpassing clouds are the main reason of such variability. Fast irradiance transitions caused by the edges of shadows can lead to situations where the grid inverter is not able to follow the global maximum power point (MPP) causing extra losses. Further, fast fluctuations of the power fed to the electric grid can cause, for example, power balance and quality problems. This paper presents a method to recognize shading events caused by moving clouds from measured irradiance data. The developed recognition method has been used to analyse shading events from 15 months of full-time irradiance recordings and the results of the analysis are presented. Further, the Linear Cloud Edge (LCE) method has been used to determinate velocities of the shadows.

#### **General information**

Publication status: Published

MoE publication type: A4 Article in a conference publication

Organisations: Department of Electrical Engineering, Research area: Power engineering

Contributors: Lappalainen, K., Valkealahti, S.

Number of pages: 6

Pages: 1568-1573

Publication date: 14 Sep 2015

#### **Host publication information**

Title of host publication: 31st European Photovoltaic Solar Energy Conference and Exhibition (31st EU PVSEC), 14– 18 September, 2015, Hamburg, Germany

ISBN (Print): 3-936338-39-6

ASJC Scopus subject areas: Energy(all)

DOIs:

10.4229/EUPVSEC20152015-5AO.7.5

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

### **Knowledge Management and Emerging Collaborative Networks in Tourism Business Ecosystems**

If we critically look at the evolution of the Tourism Industry (TI), we can note that, in the past decade, nothing has changed as much as ICTs and the Internet which caused an extensive transformation of the TI. Both demand and supply of ICT, together with innovation in transportation and international trade agreements, have evolved the tourism sector in operational workflows, management and marketing of new of tourism experiences. The massive use of new technologies has facilitated the rise of new flat organizational models where traditional brokers have disappeared, replaced by direct connections between local providers and tourists, or they have been reconfigured into new forms of dynamic and web-based tourism package providers. The depicted industry evolution shows potential, unthinkable just a few years ago, for local service providers usually marginalized from main tourism flows, due to their small sizes, and who are unable to compete in the globalized market. In many regions characterized by a niche tourism vocation, local tourism operators have started organizing themselves spontaneously in Collaborative Networks in order to create aggregate tourism offers that are able to compete with big tourism operators thus transforming regions with potential and vocation in real tourism destinations. The main socialeffect of instantiating these tourism partnerships, is the stimulus towards Tourism Business Ecosystems (TBEs) giving local tourism service providers a means for economic growth. The aim of this paper is to describe how the organizational paradigm of CNs, applied to the TBEs knowledge management and supported by ICTs, can be the key means for the growth of emerging TBEs. Such models are able to reengineer the tourism destination management model in order to gain much more flexibility in service provision and provide tourists the possibility to live an augmented tourism experience. In this paper we point out that tourism destinations, in an effort to give services able to actively support each phase of the 2.0 tourist lifecycle, can benefit from collaborative network models.

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Contributors: Ammirato, S., Michele Felicetti, A., Della Gala, M., Aramo-Immonen, H., Jussila, J.

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#### **Coopetition and company performance**

##### **General information**

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Contributors: Helander, N., Vesalainen, J., Juha, P.

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#### **Risk Assessment of Major Storm Situation in Distribution System**

Risk and reliability have a significant connection in meaning; both of them are the facts for one inference. High level of risk is resource of lower reliability. Risk management in power system has a variety of different subjects including models, methods and applications. Risk is a mixture of probability of disturbance event and the negative effect of that occurrence. Usually it counted for random accident which has harmful effect on people's life and environment. In this paper risks study of storm situation modelled. Random failures in power system are the origin of risk and cannot control by staff. Monte-Carlo Simulation (MCS) has used to model the fault frequencies and outage time of customers. The two tools which use in financial studies to make investment decision and applicable in power systems are Value-at-Risk (VaR) and Conditional Value-at-Risk (CVaR) Result of study compared to the actual reliability which confirm the improvement in the reliability of system. It is not possible to predict the precise amount of load value, Concerns of power outage in local area and possibility of a general blackout.

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Contributors: Dehghani, N., Supponen, A., Repo, S.

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#### **Two-turns antenna and magnetic materials for effective powering of mm-size implant in wireless brain-machine interface system**

##### **General information**

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### Augmenting Technology Trees: Automation and Tool Support

#### General information

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### Effects of surface cracks and strain rate on the tensile behavior of Balmoral Red granite

This paper presents an experimental procedure for studying the effects of surface cracks on the mechanical behavior of Balmoral Red granite under dynamic and quasi-static loading. Three different thermal shocks were applied on the surface of the Brazilian Disc test samples by keeping a flame torch at a fixed distance from the sample surface for 10, 30, and 60 seconds. Microscopy clearly shows that the number of the surface cracks increases with the duration of the thermal shock. After the thermal shock, the Brazilian Disc tests were performed using a servohydraulic materials testing machine and a compression Split Hopkinson Pressure Bar (SHPB) device. The results show that the tensile strength of the rock decreases and the rate sensitivity of the rock increases as more cracks are introduced to the structure. The DIC analysis of the Brazilian disc tests shows that the fracture of the sample initiates at the center of the samples or slightly closer to the incident bar contact point. This is followed by crushing of the samples at both contact points with the stress bars.

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