Concurrent Execution System for Action Languages

Traditional methods of managing concurrent processes are difficult and prone to errors. We propose that actions can provide a much simpler approach to the problem. In this paper, we use Temporal Logic of Actions to define an execution system that can be used to concurrently execute programs created with action languages. Important features of the system include naturally concurrent execution of actions, automated management of mutual exclusion, complete avoidance of low-level deadlocks, and implicit means of synchronization.

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Pervasive Computing
Authors: Jääskeläinen, A., Järvinen, H., Tiusanen, M.
Pages: 157-160
Publication date: 29 Sep 2017

Host publication information
Title of host publication: Proceedings of 15th ACM-IEEE International Conference on Formal Methods and Models for System Design
Place of publication: Vienna, Austria
Publisher: ACM
Editors: Talpin, J., Derler, P., Schneider, K.
ISBN (Electronic): 978-1-4503-5093-8
ASJC Scopus subject areas: Computer Science(all)
DOIs: 10.1145/3127041.3127062
Research output: Scientific - peer-review » Conference contribution

Interactive Visualization Tools to Improve Learning and Teaching in Online Learning Environments

This paper presents two interactive visualization tools for learning management systems (LMS) in order to improve learning and teaching in online courses. The first tool was developed at the Intelligent Information Systems Laboratory (IISLab) at the Tampere University of Technology (TUT). The tool is used to analyse students' activity from automatically recorded user log data and to build interactive visualizations. They provide valuable insights into the learning process and participation of students in a course offered to teachers and students. The second tool was developed at the Unitelma Sapienza University. It extends navigation and search functionalities in the discussion forum of an LMS with a topic-driven paradigm. The tool analyses forum content and automatically identifies discussion topics. It then enhances the original forum with a topic-driven navigation structure and an interactive search graph. Both tools have been developed as plug-ins for the Moodle LMS, but their analysis processes and techniques can be adopted into any LMS.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Financial Services, Department of Mathematics, Research group: MAT Intelligent Information Systems Laboratory, Unitelma Sapienza University, University of Sannio, National University of La Plata
Authors: Kuosa, K., Distante, D., Tervakari, A., Cerulo, L., Fernández, A., Koro, J., Kailanto, M.
Number of pages: 21
Pages: 1-21
Publication date: Jan 2016
Peer-reviewed: Yes

Publication information
Journal: International Journal of Distance Education Technologies
Volume: 14
Issue number: 1
Article number: 1
ISSN (Print): 1539-3100
Ratings:
Scopus rating (2016): SJR 0.157 SNIP 0.328 CiteScore 0.47
Scopus rating (2015): SJR 0.141 SNIP 0.302 CiteScore 0.44
Scopus rating (2014): SJR 0.165 SNIP 0.279 CiteScore 0.33
Scopus rating (2013): SJR 0.214 SNIP 0.428 CiteScore 0.44
Scopus rating (2012): SJR 0.168 SNIP 0.36 CiteScore 0.3
Scopus rating (2011): SJR 0.244 SNIP 0.467 CiteScore 0.41
Scopus rating (2010): SJR 0.376 SNIP 0.475
A State Space Tool for Concurrent System Models Expressed In C++

This publication introduces a state space exploration tool that is based on representing the model under verification as a piece of C++ code that obeys certain conventions. This approach facilitates experimenting with many kinds of modelling ideas. On the other hand, the use of stubborn sets and symmetries requires that either the modeller or a preprocessor tool analyses the model at a syntactic level and expresses stubborn set obligation rules and the symmetry mapping as suitable C++ functions. The tool supports the detection of illegal deadlocks, safety errors, and may progress errors. It also partially supports the detection of must progress errors.

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Mathematics, Research group: MAT Computer Science and Applied Logics, Regulation of learning and active learning methods (REALMEE)
Authors: Valmari, A.
Number of pages: 15
Pages: 91-105
Publication date: 14 Dec 2015

Host publication information
Title of host publication: SPLST 2015 Symposium on Programming Languages and Software Tools : Proceedings of the 14th Symposium on Programming Languages and Software Tools (SPLST'15) Tampere, Finland, Oct 9-10, 2015
Volume: 1525
Publisher: CEUR-WS.org
Editors: Nummenmaa, J., Sievi-Korte, O., Mäkinen, E.
Article number: 7

Publication series
Name: CEUR Workshop Proceedings
Volume: 1525
ISSN (Electronic): 1613-0073
ASJC Scopus subject areas: Software
Keywords: model checking; stubborn sets; symmetries; safety; progress
Links:

Stop It, and Be Stubborn!
A system is always may-terminating, if and only if from every reachable state, a terminal state is reachable. This publication argues that it is beneficial for both catching non-progress errors and stubborn, ample, and persistent set state space reduction to try to make verification models always may-terminating. An incorrect mutual exclusion algorithm is used as an example. The error does not manifest itself, unless the first action of the customers is modelled differently from other actions. An appropriate method is to add an alternative first action that models the customer stopping for good. This method typically makes the model always may-terminating. If the model is always may-terminating, then the basic strong stubborn set method preserves safety and some progress properties without any additional condition for solving the ignoring problem. Furthermore, whether the model is always may-terminating can be checked efficiently from the reduced state space.

General information
State: Published
Using context overlays to analyse the role of a priori information with Process Mining

Notwithstanding the significant advances in context-aware computing in pervasive computing and self-adaptive systems, there is still much more to be desired in providing better context services. The number of sensors deployed world-wide increases very rapidly. The Internet of Things, amongst others, generates vast amounts of data of many different data types. How data are used is essential to improve user experience and efficiencies of the systems in which they occur. We explain how familiar concepts of Process Mining strengthen generalised sensor context services. We present a laboratory case to explain the approach. By way of a real-world example, we confirm the viability of using Process Mining to strengthen context-aware computing.

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Mathematics, Research group: MAT Intelligent Information Systems Laboratory
Authors: Pileggi, P., Rivero Rodriguez, A., Nykänen, O.
Number of pages: 6
Pages: 639-644
Publication date: 2015

Host publication information
Title of host publication: 2015 IEEE International Systems Conference (SysCon 2015) Proceedings
Place of publication: Vancouver, BC, Canada
Publisher: IEEE
ISBN (Print): 978-1-4799-5927-3
Keywords: Context-aware computing, Process mining, Self-adaptive systems, Pervasive computing
DOIs: 10.1109/SYSCON.2015.7116823
Links: http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7116823
Research output: Scientific - peer-review » Conference contribution

An algebraic study of Peterson’s Intermediate Syllogisms

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Mathematics, Research Community on Data-to-Decision (D2D)
Authors: Turunen, E.
Number of pages: 14
Pages: 1-14
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Soft Computing
ISSN (Print): 1432-7643
Ratings:
Scopus rating (2016): SJR 0.75 SNIP 1.204 CiteScore 2.07
Scopus rating (2015): SJR 0.724 SNIP 1.179 CiteScore 1.53
Scopus rating (2014): SJR 0.793 SNIP 1.518 CiteScore 2.01
Scopus rating (2013): SJR 0.857 SNIP 1.454 CiteScore 2
Scopus rating (2012): SJR 0.805 SNIP 1.232 CiteScore 1.94
Scopus rating (2011): SJR 0.892 SNIP 1.817 CiteScore 2.38
Scopus rating (2010): SJR 0.736 SNIP 1.303
Scopus rating (2009): SJR 0.744 SNIP 1.417
Scopus rating (2008): SJR 0.776 SNIP 1.228
Another paraconsistent algebraic semantics for Lukasiewicz-Pavelka logic

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Mathematics, Research Community on Data-to-Decision (D2D)
Authors: Rodriguez, J. T., Turunen, E., Ruan, D., Montero, J. 
Number of pages: 16
Pages: 132-147
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Fuzzy Sets and Systems
Volume: 242
ISSN (Print): 0165-0114
Ratings:
Scopus rating (2016): SJR 1.506 SNIP 1.977 CiteScore 2.88
Scopus rating (2015): SJR 1.43 SNIP 1.816 CiteScore 2.34
Scopus rating (2014): SJR 1.461 SNIP 2.278 CiteScore 2.67
Scopus rating (2013): SJR 1.439 SNIP 2.189 CiteScore 2.55
Scopus rating (2012): SJR 1.617 SNIP 2.468 CiteScore 2.97
Scopus rating (2011): SJR 1.518 SNIP 2.017 CiteScore 2.84
Scopus rating (2010): SJR 1.381 SNIP 2.189
Scopus rating (2009): SJR 1.337 SNIP 2.011
Scopus rating (2008): SJR 1.635 SNIP 2.139
Scopus rating (2007): SJR 1.554 SNIP 2.23
Scopus rating (2006): SJR 1.166 SNIP 2.306
Scopus rating (2005): SJR 0.846 SNIP 1.898
Scopus rating (2004): SJR 0.943 SNIP 1.773
Scopus rating (2003): SJR 0.789 SNIP 1.399
Scopus rating (2002): SJR 1.012 SNIP 1.127
Scopus rating (2001): SJR 0.944 SNIP 1.134
Scopus rating (2000): SJR 0.457 SNIP 1.275
Scopus rating (1999): SJR 0.458 SNIP 1.346
Original language: English
DOIs:
10.1016/j.fss.2013.06.011
A Simple Character String Proof of the "True but Unprovable" Version of Gödel's First Incompleteness Theorem

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Mathematics, Regulation of learning and active learning methods (REALMEE)
Authors: Valmari, A.
Number of pages: 15
Pages: 355-369
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Electronic Proceedings in Theoretical Computer Science
Volume: 151
Article number: 25
ISSN (Print): 2075-2180
Original language: English
DOIs:
10.4204/EPTCS.151.25

Bibliographical note
Paper presented also in the Proceedings of the 14th International Conference Automata and Formal Languages (AFL 2014).<br/>Contribution: organisation=mat,FACT1=1<br/>Portfolio EDEND: 2014-11-17<br/>Publisher name: Open Publishing Association

Asymptotic Proportion of Hard Instances of the Halting Problem

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Mathematics, Regulation of learning and active learning methods (REALMEE)
Authors: Valmari, A.
Number of pages: 24
Pages: 307-330
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Acta Cybernetica
Volume: 21
Issue number: 3
ISSN (Print): 0324-721X
Ratings:
Scopus rating (2016): SJR 0.177 SNIP 0.275 CiteScore 0.39
Scopus rating (2015): SJR 0.171 SNIP 0.911 CiteScore 0.46
Scopus rating (2014): SJR 0.158 SNIP 0.597 CiteScore 0.31
Scopus rating (2013): SJR 0.139 SNIP 0.264 CiteScore 0.29
Scopus rating (2012): SJR 0.197 SNIP 0.438 CiteScore 0.41
Scopus rating (2011): SJR 0.202 SNIP 0.686 CiteScore 0.33
Scopus rating (2010): SJR 0.176 SNIP 0.228
Scopus rating (2009): SJR 0.184 SNIP 0.496
Scopus rating (2008): SJR 0.197 SNIP 0.092
Scopus rating (2007): SJR 0.149 SNIP 0.275
Scopus rating (2006): SJR 0.239 SNIP 0.501
Diamonds Are a Girl's Best Friend: Partial Order Reduction for Timed Automata with Abstractions

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Mathematics
Authors: Hansen, H., Lin, S., Liu, Y., Nguyen, T. K., Sun, J.
Number of pages: 16
Pages: 391-406
Publication date: 2014

Host publication information
Publisher: Springer International Publishing
Editors: Biere, A., Bloem, R.
ISBN (Print): 978-3-319-08866-2
ISBN (Electronic): 978-3-319-08867-9

Publication series
Name: Lecture Notes in Computer Science
Volume: 8559
ISSN (Print): 0302-9743
DOI: 10.1007/978-3-319-08867-9_26
Links:
http://link.springer.com/chapter/10.1007%2F978-3-319-08867-9_26

Minimal Solutions of Fuzzy Relation Equations with General Operators on the Unit Interval

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Mathematics, Research Community on Data-to-Decision (D2D)
Authors: Medina, J., Turunen, E., Bartl, E., Diaz-Moreno, J. C.
Number of pages: 10
Old and New Algorithms for Minimal Coverability Sets

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Mathematics, Regulation of learning and active learning methods (REALMEE)
Authors: Valmari, A., Hansen, H.
Number of pages: 25
Pages: 1-25
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Fundamenta Informaticae
Volume: 131
Issue number: 1
ISSN (Print): 0169-2968
Ratings:
Scopus rating (2016): SJR 0.396 SNIP 0.77 CiteScore 0.86
Scopus rating (2015): SJR 0.419 SNIP 0.847 CiteScore 0.84
Scopus rating (2014): SJR 0.499 SNIP 1.044 CiteScore 1
Scopus rating (2013): SJR 0.528 SNIP 1.174 CiteScore 0.97
Scopus rating (2012): SJR 0.494 SNIP 1.047 CiteScore 0.87
Scopus rating (2011): SJR 0.398 SNIP 1.006 CiteScore 0.77
Scopus rating (2010): SJR 0.428 SNIP 0.945
Scopus rating (2009): SJR 0.472 SNIP 0.99
Scopus rating (2008): SJR 0.673 SNIP 1.022
Scopus rating (2007): SJR 0.587 SNIP 1.145
Scopus rating (2006): SJR 0.573 SNIP 1.165
Scopus rating (2005): SJR 0.544 SNIP 1.14
Scopus rating (2004): SJR 0.574 SNIP 1.293
Scopus rating (2003): SJR 0.532 SNIP 1.397
Scopus rating (2002): SJR 0.6 SNIP 0.987
Scopus rating (2001): SJR 0.484 SNIP 0.99
Scopus rating (2000): SJR 0.339 SNIP 0.698
Scopus rating (1999): SJR 0.335 SNIP 0.873
Does the Shannon bound really apply to all data structures

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Mathematics, Regulation of learning and active learning methods (REALMEE)
Authors: Valmari, A.
Number of pages: 12
Pages: 47-58
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Proceedings of the Estonian Academy of Sciences
Volume: 62
Issue number: 1
ISSN (Print): 1736-6046
Ratings:
Scopus rating (2016): CiteScore 0.52 SJR 0.238 SNIP 0.45
Scopus rating (2015): SJR 0.195 SNIP 0.863 CiteScore 0.77
Scopus rating (2014): SJR 0.198 SNIP 0.581 CiteScore 0.42
Scopus rating (2013): SJR 0.218 SNIP 0.671 CiteScore 0.52
Scopus rating (2012): SJR 0.199 SNIP 0.474 CiteScore 0.53
Scopus rating (2011): SJR 0.312 SNIP 0.644 CiteScore 0.66
Scopus rating (2010): SJR 0.289 SNIP 0.438
Scopus rating (2009): SJR 0.19 SNIP 0.246
Scopus rating (2008): SJR 0.104 SNIP 0.185
Scopus rating (2007): SJR 0.104 SNIP 0.192
Original language: English
DOI:
10.3176/proc.2013.1.06
Links:

Bibliographical note
Samalla otsikolla nimetty artikkelji julkaistu 12th Symposium on Programming Languages and Software Tools - konferenssin julkaisussa (http://www.cs.ioc.ee/splst11/index.php?page=proc) (r=51222); Kas shannoni alamtõke on ikka köigile andmestruktuurdile kohaldataväng?

Tiedonlouhintaa tieliikenneonttomuussatasa

General information
State: Published
A Lukasiewicz-style Many-Valued Similarity Reasoning: Review

General information
State: Published
Ministry of Education publication type: A3 Part of a book or another research book
Organisations: Matematiikka
Authors: Turunen, E.
Number of pages: 34
Pages: 315-348
Publication date: 2003

Host publication information
Title of host publication: Beyond Two: Theory and Applications of Multiple-Valued Logic
Place of publication: Heidelberg
Publisher: Physica-Verlag
Editors: Fitting, M., Orlowska, E.
ISBN (Print): 3-7908-1541-1

Publication series
Name: Studies in Fuzziness and Soft Computing
ISSN (Print): 1434-9922
Research output: Scientific - peer-review → Chapter