

Theory of Modeling and Simulation: DEVS Integrative M&S Symposium 2012

(DEVS 2012)

**2012 Spring Simulation Multiconference
Simulation Series Volume 44 Number 4**

**Orlando, Florida, USA
26-30 March 2012**

Editors:

**Gabriel Wainer
Pieter Mosterman**

**Andrea D'Ambrogio
Gregory Zacharewicz**

ISBN: 978-1-61839-786-7

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com



Some format issues inherent in the e-media version may also appear in this print version.

© 2012 SIMULATION COUNCILS, INC.

Responsibility for the accuracy of all statement in each paper rests solely with the author(s). Statements are not necessarily representative of, nor endorsed by, The Society for Modeling and Simulation International.

Printed by Curran Associates, Inc. (2012)

Permission is granted to photocopy portions of this publication for personal use and for the use of students provided credit is given to the conference and publication. Permission does not extend to other types of reproduction nor to copying for incorporation into commercial advertising nor for any other profit-making purpose. Other publications are encouraged to include 300- to 500-word abstracts or excerpts from any paper contained in this book, provided credits are given to the author and the conference. For permission to publish a complete paper write: The Society for Modeling and Simulation International (SCS), 2598 Fortune Way, Suite I, San Diego, CA 92081, USA.

Additional copies of the Proceedings are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
curran@proceedings.com
www.proceedings.com/0128.html

or

The Society for Modeling
and Simulation International
2598 Fortune Way, Ste I
Vista, CA 92081 USA
www.scs.org

ISBN: 978-1-61839-786-7
PRINTED IN THE UNITED STATES

TABLE OF CONTENTS

Modeling and Simulation of Time-Varying Delays.....	1
<i>Fu Zhang, Murali Yeddanapudi</i>	
SAN LITE-SOLVER: A User-friendly Software Tool to Solve SAN Models	9
<i>Afonso Sales</i>	
ModelicaML Value Bindings for Automated Model Composition	17
<i>Wladimir Schamai, Peter Fritzson, Christiaan J. J. Paredis, Philipp Helle</i>	
Approaching Complexity in Modeling and Simulation of Logistics Systems (WIP).....	25
<i>Markus Koch, Juri Tolujew, Michael Schenk</i>	
Predicting Memcached Throughput Using Simulation and Modeling.....	31
<i>Steven Hart, Eitan Frachtenberg, Mateusz Berezecki</i>	
Formal Specification of Multisimulations Using Maude	39
<i>Leila Jalali, Carolyn Talcott, Nalini Venkatasubramanian, Sharad Mehrotra</i>	
Design and Implementation of Event-based DEVS Execution Environment for Faster Execution of Iterative Simulation.....	47
<i>Se Jung Kwon, Tag Gon Kim</i>	
The DEVS-Driven Modeling Language: Syntax and Semantics Definition by Meta-Modeling and Graph Transformation.....	55
<i>Ufuoma Bright Ighoroje, Oumar Maiga, Mamadou Kaba Traoré</i>	
Automation Of SysML Activity Diagram Simulation With Model-Driven Engineering Approach.....	61
<i>Damien Foures, Vincent Albert, Jean-Claude Pascal, Alexandre Nketsa</i>	
Scheduling Model for a Tool Evaluating New Radiotherapies	67
<i>Anastasya Shtiliyanova, Fabien Feschet, Pascal Pommier</i>	
Modeling the Optimized Link-State Routing Protocol for Verification.....	73
<i>Matthew F. Steele, Todd R. Andel</i>	
DEVSML 2.0: The Language and the Stack	81
<i>Saurabh Mittal, Scott A. Douglass</i>	
ΦDEVS: Phase Based Discrete Event Modeling	93
<i>H. Job Honig, Mamadou D. Seck</i>	
Frontier Modeling Support Environment: Flexibility to Adapt to Diverse Stakeholders	101
<i>Bernard P. Zeigler, James Nutaro, Chungman Seo, Steven Hall, Pamela Clark, Michael Rilee, Sidney Bailin, Thomas Speller, Walter Powell</i>	
Modeling and Simulation of Mobile Phones Using Dynamic Topologies	112
<i>Fernando J. Barros</i>	
DEVS Modeling of Urban Traffic Systems (WIP).....	120
<i>Donghun Kang, Joohoe Kong, Byoung Kyu Choi</i>	
A Model-Based Method for System Reliability Analysis.....	126
<i>Alfredo Garro, Andrea Tundis</i>	
Coordination of Ambulance Team Agents in Rescue Simulation Using Auction Strategy with Obstinate Agents.....	134
<i>Pooya Deldar Gohardani, Peyman Ardestani, Behrooz Masoumi, Mohammad Reza Meybodi, Peyman Ardestani, Siavash Mehrabi</i>	
Designing Digital Circuits for FPGAs Using Parallel Genetic Algorithms (WIP).....	140
<i>Rizwan A. Ashraf, Francis Luna, Damian Dechev, Ronald F. Demara</i>	
Adapting Model-Based Testing Techniques to DEVS Models Validation	146
<i>Diego A. Hollmann, Maximiliano Cristiá, Claudia Frydman</i>	
A Multi-Actor Spatio-Temporal Interaction Model Used to Geosimulate the Zoonosis Propagation (WIP)	154
<i>Mondher Boudjen, Bernard Moulin</i>	
PRoModel: A Model-Driven Software Environment that Facilitates and Expedites the Development of Systems that Handle Uncertainty.....	160
<i>Rosa López-Landa, Julieta Noguera</i>	
Modular Mathematical Modelling of Biological Systems.....	168
<i>Mandeep Gill, Steve McKeever, David Gavaghan</i>	
Model-based Generation of Scenario-specific Event Sequences for the Simulation of Recurrent User Behavior within Context-Aware Applications (WIP)	176
<i>Sandro Rodriguez Garzon, Dmytro Hritsevskyy</i>	

Generating Simulation Models from UML - A FireSat Example	182
<i>Johannes Groß, Stephan Rudolph</i>	
On Time Granularity and Event Granularity in Simulation Service Composition (WIP).....	190
<i>Song Guo, Xiaolin Hu, Xiaoming Wang</i>	
Simulation Model Standardization through Web Services: Interoperation and Federation on the DEVS/SOA Platform.....	196
<i>Chungman Seo, Bernard P. Zeigler</i>	
Qualitative Verification of Finite and Real-Time DEVS Networks.....	204
<i>Moon Ho Hwang</i>	
Formal Modelling and Analysis of Behaviour Grading within a Peer-to-Peer Storage System.....	212
<i>Samira Chaou, Franck Pommereau</i>	
Validating Manufacturing Processes Using Timed Sequential Machines: Application to a Semiconductor Manufacturing Process (WIP).....	220
<i>Pamela Viale, Norbert Giambiasi, Claudia Frydman, Jacques Pinaton</i>	
Model-Based Software In-the-Loop-Test of Autonomous Systems	226
<i>Andreas Bayha, Franziska Grüneis, Bernhard Schätz</i>	
Simulation of an Electrical Network and Control System in SysML	232
<i>Matthew Hause, James Hummell</i>	
Discrete-Event System-on-a-Chip with Universal Event Tracer and Floating-Point Synchronizer for Interoperation of a DEVS Simulator and an On-Chip Debugger.....	239
<i>Daejin Park, Tag Gon Kim</i>	
Activity-based Credit Assignment (ACA) in Hierarchical Simulation.....	247
<i>Alexandre Muzy, Bernard P. Zeigler</i>	
Abstracted CPS Model: A Model for Interworking between Physical System and Simulator for CPS Simulation (WIP).....	255
<i>Ji-Yeon Kim, Dal-Nim Choi, Hyung-Jong Kim, Jin-Myoung Kim, Won-Tae Kim</i>	
An Approach to Translate Legacy ‘C’ Code to Simulink® Model Using XML	261
<i>Chethan Kotekar</i>	
Automated Performance Analysis of Business Processes	266
<i>Paolo Bocciarelli, Andrea D’Ambrogio</i>	
Lattice Boltzmann Approach to Acoustic Propagation for Underwater Warfare Simulation	275
<i>Sol Ha, Namkug Ku, Kyu-Yeul Lee</i>	
Using Workflows And Web Services To Manage Simulation Studies (WIP)	284
<i>Judicaël Ribault, Gabriel Wainer</i>	
Exploring Multi-Level Model Dynamics: Performance and Accuracy (WIP).....	290
<i>Cagri Tekinay, Mamadou D. Seck, Alexander Verbraeck</i>	
Calibration of Deployment Simulation Models – A Multi-Paradigm Modelling Approach	296
<i>Joachim Denil, Hans Vangheluwe, Paul De Meulenaere, Serge Demeyer</i>	
Model Transformation from BPMN to DEVS in the MDD4MS Framework.....	304
<i>Deniz Cetinkaya, Alexander Verbraeck, Mamadou D. Seck</i>	
BOM2UML: Integrating BOM Specifications into UML-based Development Environments	310
<i>Daniele Gianni, Andrea D’Ambrogio, Marco Grasso</i>	
Analyzing a Subsystem to Identify Properties of a Large System: An Application in Airline Routing Decisions	318
<i>R. Mukkamala, J. Creedon, P. Ghazizadeh</i>	
PSYOPS and CIMIC Operations: From Concepts to G-DEVS Models	326
<i>Colette Faucher, Gregory Zacharewicz, Amine Hamri, Claudia Frydman</i>	
EMF-DEVS Modeling	334
<i>Hessam S. Sarjoughian, Abbas Mahmoodi Markid</i>	
Validation of Service Oriented Computing DEVS Simulation Models	342
<i>Hessam S. Sarjoughian, Mohammed Muqsith, Dazhi Huang, Stephen S. Yau</i>	
A Method to Federate a Discrete Event-Based Logistics Simulator and a Discrete Time Step-Based Traffic Microsimulator: A Transportation Case Study.....	350
<i>Thomas A. Wall, Michael Hunter, Michael O. Rodgers</i>	
SysML to Discrete-event Simulation to Analyze Electronic Assembly Systems.....	357
<i>Ola Batarseh, Leon F. McGinnis</i>	
M&S-based Design of Embedded Controllers on Network Processors.....	365
<i>Rodrigo Castro, Iván Ramello, Matías Bonaventura, Gabriel A. Wainer</i>	
On the Verification of Hybrid DEVS Models	373
<i>Hesham Saadawi, Gabriel Wainer</i>	
Music Generation Using Cellular Models.....	381
<i>Heather Morris, Gabriel Wainer</i>	

G-DEVS Based Simulation of Toy Industry Client Behavior in PSS (WIP)..... 389

Thècle Alix, Gregory Zacharewicz

Author Index