

Book 1 - SCSC'10
PROCEEDINGS OF THE 2010 SUMMER SIMULATION MULTICONFERENCE
12-14 July – Ottawa, ON Canada

2010 Summer Simulation Multiconference Books:

Book 1 – Summer Computer Simulation Conference (SCSC)

Book 2 – International Symposium on Performance Evaluation of
Computer and Telecommunication Systems (SPECTS)

Book 3 – Grand Challenges in Modeling & Simulation Symposium (GCMS)

SummerSim 2010

Conference Chairs:

Agostino Bruzzone, MISS DIPTeM, University of Genoa, Italy

Hamid Vakilzadian, University of Nebraska, Lincoln, USA

Production Staff:

Diane “DJ” Weed

Aleah Hockridge

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.

© 2010 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. (2010)

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), P.O. Box 17900, San Diego, CA 92177, 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

ISBN: 978-1-61738-702-9
PRINTED IN THE UNITED STATES

TABLE OF CONTENTS – SCSC ‘10

<u>TITLE/AUTHOR</u>	<u>Pg #</u>
Integration of Induction Generator Dynamics in Multimachine System Transient Analysis Abu Rahim and Edwin Nowicki (ahrahim@kfupm.edu.sa)	9
Simulation Analyzes Deadlock Concerns in Automotive Manufacture Dominic Baffo, Edward Williams and Onur Ülgen (ewilliams@pmcorp.com)	17
A Comparative Study on Car Ownership Modeling by Applying Fuzzy Linear Regression and Artificial Neural Network: Case Study of IRAN Koosha Rafiee, Ali Azadeh and Amir-Mohammad Zohrevand (aazadeh@ut.ac.ir)	25
A Comparison of Artificial Neural Network and Fuzzy Linear Regression in Tire Reliability Analysis Koosha Rafiee, Ali Azadeh and Amir-Mohammad Zohrevand (aazadeh@ut.ac.ir)	32
Analysis of X3D Scene, Web X3D Objects and Media Panoramas Jussara Kofuji, Sergio Kofuji and Marcelo Zuffo (jussara@lsi.usp.br)	40
Modeling and Analysis of Canadian Forces RSOM Hubs for Northern Operations Ahmed Ghanmi (ahmed.ghanmi@forces.gc.ca)	48
Simulating a LAGS Processor to Consider Variable Latency on L1 D-Cache J. Manuel Colmenar, Oscar Garnica, Juan Lanchares and J. Ignacio Hidalgo (jmcolmenar@cesfelipesegundo.com)	56
Operators training in container terminals by using advanced 3D simulation Antonio Cimino, Francesco Longo and Giovanni Mirabelli (f.longo@unical.it)	64
Modeling and Simulation of Airship Logistics Heavy Lift for Military Applications Abderrahmane Sokri and Ahmed Ghanmi (Abderrahmane.Sokri@forces.gc.ca)	70
Tactical Vehicle Fleet Mix Optimization Ahmed Ghanmi, Leanne Stuive and Slawomir Wesolkowski (Ahmed.Ghanmi@forces.gc.ca)	78
CoUAV: A Multi-UAV Cooperative Search Path Planning Simulation Environment Jens Happe and Jean Berger (jhappe@mdacorporation.com)	86
The Arena Career Modelling Environment - A New Workforce Modelling Tool for the Canadian Forces Antony Zegers and Stan Isbrandt (antony.zegers@forces.gc.ca)	94
Modeling with Non-cooperative Agents: Destructive Search for Randomly Located Objects. Dragos Calitoiu and Dan Milici (dcalitoi@scs.carleton.ca)	102
A Framework for Modeling Mosquito Vectors James Gentile, Gregory Davis, Brandy St. Laurent and Steve Kurtz (jegentile@gmail.com)	110

DEFINING SIMULATION CAPABILITIES FOR POTENTIAL SEA BASE ENABLER: INNOVATIVE NAVAL PROTOTYPE TRANSFORMABLE CRAFT (T-Craft) Ryan Hernandez (rmhernan@nps.edu)	118
Verbal control of Mathematical Tools for Simulation and Virtual Environments John Richardson (warthogale@aol.com)	124
Simulating Tightly Intermeshing, Co-Rotating Twin Screw Extruders with SIGMA Nils Kretzschmar and Volker Schoeppner (nils.kretzschmar@ktp.upb.de)	133
Stay at Home, Wash Your Hands: Epidemic Dynamics with Awareness of Infection Adam Kleczkowski and Savi Maharaj (savi@cs.stir.ac.uk)	141
Multiobjective Evolutionary Optimization of a Transportation Fleet with a New Monetary Cost Function Slawomir Wesolkowski, Ziad Sakr, Bruno Di Stefano and Anna Lawniczak (s.wesolkowski@ieee.org)	147
The Logistics Process Analysis Tool: Combining Agent-Based and Discrete Event Simulation for Improved Logistics Analysis Charles Van Groningen, Mary Duffy Braun, Brian Craig, Kathy Lee Simunich and Charles Olson (chuck.olson@anl.gov)	154
N-body parallel model of tumor proliferation Rafal Wcislo, Pawel Gosztyla and Witold Dzwinel (dzwinel@agh.edu.pl)	160
Markov Process Modeling and Simulation for Wireless Sensor Network Life Estimation with QoS Constrains Zhanyang Zhang and Miriam Tausner (zhanyang.zhang@csi.cuny.edu)	168
Investigating Immune System Aging: System Dynamics and Agent Based Modelling Grazziela Figueredo and Uwe Aickelin (gpfiqueredo@gmail.com)	174
SCHNAPS: A Generic Population-based Simulator for Public Health Purposes Audrey Durand, Christian Gagné, Marc-André Gardner, François Rousseau, Yves Giguère and Daniel Reinharz (audrey.durand.2@ulaval.ca)	182
Design and Implementation of Configurable Simulation System for Embedded Software Based on MDA Xiang Ji, Yunwei Dong and Yuying Wang (jixaing@yahoo.cn)	190
Route Reasoning-based Mobility Modeling and Simulation for Street Fight using DEVS Kyu Cheol Cho, Sung Ho Jang, Chang Hyeon Noh, Tae Young Kim, Jong Sik Lee, Jae Min Lee, Tae Sup Kim and Kang Sun Lee (landswell@empal.com)	195
An Agent-based Model of the Anopheles gambiae Mosquito Life Cycle Ying Zhou, S. M. Niaz Arifin, James Gentile, Steven Kurtz, Gregory Davis, Barbara Wendelberger and Greg Madey (yzhou3@nd.edu)	201
Symbolic Flattening of DEVS Models Bin Chen and Hans Vangheluwe (nudtc9372@gmail.com)	209

CFD Modelling as an Integrated Part of Multi-Level Simulation of Process Plants – Semantic Modelling Approach Marek Gayer, Juha Kortelainen and Tommi Karhela (marek999@seznam.cz)	219
A DEVS fire jumps model and associated simulations using ForeFire Bahaa NADER, Jean Baptiste FILIPPI and Paul Antoine BISGAMBIGLIA (nader@univ-corse.fr)	228
Verification & Validation by Docking: A Case Study of Agent-Based Models of Anopheles gambiae S. M. Niaz Arifin, Gregory J. Davis, Ying Zhou and Gregory R. Madey (sarifin@nd.edu)	236
A Framework of Intentional Characters for Simulation of Social Behavior. Luís César da Costa, Esteban Walter Gonzales Clua, Gilson Antônio Giraldi, Bruno Richard Schulze, Anselmo A. Montenegro, Reinaldo A. C. Bianchi and Flavia Bernardini (fcbernardini@vm.uff.br)	244
Towards a deliberative agent system based on DEVS formalism for application in agriculture Mahuna Akplogan, Gauthier Quesnel, Frédérick Garcia, Alexandre Joannon and Roger Martin-Clouaire (mahuna.akplogan@toulouse.inra.fr)	250
The Role of MSIAC in Supporting Modeling and Simulation Jerry Feinberg and Robert Graebener (jfeinberg@alionscience.com)	258
Simulation-Based Mapping of Capacity-Dependent General Optimal Market Area Model Zbigniew Pasek and Marzieh Mehrjoo (zjpasek@uwindsor.ca)	264
Dynamic Cloud Simulation Using Cellular Automata and Texture Splatting Eric Upchurch and Sudhansu K. Semwal (eric.upchurch@cobham.com)	270
Cloud Dynamics Simulation with Cellular Automata Alisson Rodrigo and Maury Gouvea Jr. (maury@pucminas.br)	278
Modeling and Simulation Education for the Medical and Health Sciences John Sokolowski and Catherine Banks (jsokolow@odu.edu)	284
An Activity-Object World View for ABCmod Conceptual Models Gilbert Arbez and Louis Birta (garbez@site.uottawa.ca)	290
SIMULATING THE IMPACTS OF A NEW MADRID EARTHQUAKE ON THE REGIONAL ELECTRIC INFRASTRUCTURE Edgar Portante, James Kavicky, Stephen Folga, GUSTAV WULFKUHLE, Brian Craig and LEAH TALABER (ecportante@anl.gov)	298
Real-Time Step Motor Emulation for Hardware-in-the-Loop Simulation Alvaro Oceguera, Twan Basten, Lou Somers and Sander Hulsboom (lou.somers@oce.com)	306
A New Dynamic Cell Formation Model by Considering Machine Sequence and Labor-Intensive Situation	314

[Ali Azadeh, Mohammad Sheikhalishahi and Mohammad Zamanipour \(aazadeh@ut.ac.ir\)](#)

Accelerating the computation of parallel trajectories of gradient descent with the Cell-BE multiprocessor environment

[Gabriel Wainer and Yuri Boiko \(yboiko@connect.carleton.ca\)](#) 320

Insight3D: A High Performance Toolkit for Advanced Visualization of Space and Terrestrial Environments

[Graham Beasley \(gbeasley@agi.com\)](#) 328

Creation of DEVS Models using Imitation Learning

[Michael Floyd and Gabriel Wainer \(mfloyd@sce.carleton.ca\)](#) 334

Conservative vs. Optimistic Parallel Simulation of DEVS and Cell-DEVS: a Comparative Study

[Shafagh Jafer and Gabriel Wainer \(shafaghj@hotmail.com\)](#) 342

P-SAM: A Post-Simulation Analysis Module for Agent-Based Models

[S. M. Niaz Arifin, Ryan C. Kennedy, Kelly E. Lane, Gregory R. Madey, Agustin Fuentes and Hope Hollocher \(sarifin@nd.edu\)](#) 350

A Game Theoretical Approach to Modeling Full-Duplex Information Dissemination

[Dmitry Zinoviev and Vy Duong \(dmitry@mcs.suffolk.edu\)](#) 358

Simulation and Optimization of the Pre-hospital Care System of the National University of Mexico using Travelling Salesman Problem algorithms.

[Esther Segura, Luis Altamirano and Idalia Flores \(idalia@servidor.unam.mx\)](#) 364

Simulation of Stream Denitrification for Watershed Model

[Ping Wang, Gary Shenk and Lewis Linker \(pwang@chesapeakebay.net\)](#) 371

A Variable Neighbourhood Search Combining Constraint Programming and Lagrangean Relaxation for Solving Routing Problems

[Rosa Herrero, Daniel Guimarans, Juan José Ramos and Silvia Padrón \(Daniel.Guimarans@uab.cat\)](#) 379

Hash Life algorithm on 3D excitable medium Application to Integrative Biology

[Jonathan Caux, David Hill and Pridi Siregar \(jonathan.caux@isima.fr\)](#) 387

Enhancing DEVS Simulation through Template Metaprogramming: DEVS-MetaSimulator

[Luc Touraille, Mamadou K. Traoré and David R.C. Hill \(touraille@isima.fr\)](#) 394

Formal Specification and Analysis of Accelerated Heartbeat Protocols

[Muhammad Atif and MohammadReza Mousavi \(m.atif@tue.nl\)](#) 403

Development of Virtual Training Simulators with Modelica

[Carla Martin-Villalba, Alfonso Urquia and Sebastian Dormido \(carla@dia.uned.es\)](#) 413

Using Specification and Description Language to define and implement discrete simulation models

[Pau Fonseca i Casas \(pau@fib.upc.edu\)](#) 419

Virtual Intelligence, Surveillance and Reconnaissance Evaluation Environment

427

Rahim Jassemi-Zargani, Wayne Robbins, Chris Helleur, Sean Bourdon, Nathan Kashyap and David Campbell (rahim.jassemi-zargani@forces.gc.ca)	
Modelling Environmental Impact and Efficiency in Maritime Logistics Agostino Bruzzone, Marina Massei, Francesca Madeo and Federico tarone (agostino@itim.unige.it)	433
A modeling methodology for process control in the automated manufacturing system Hyeong-tae Park, Jong-Geun Kwak, Gi-Nam Wang and Sang-chul Park (taiji416@ajou.ac.kr)	439
A Simulation model to improve air cargo operations in passenger aircraft Miquel Angel Piera Eroles (miquelangel.piera@uab.cat)	446
On Simulating Episodic Events Against a Background of Noise-like Non-episodic Events Colin Bellinger and John Oommen (cbelling@scs.carleton.ca)	452
Hybrid Search Algorithm to Optimize Scheduling Problems for TCPN Models Miguel Antonio Mujica and Miquel Angel Piera (miguelantonio.mujica@uab.es)	461
DEVS-based Modeling of a Human Motion Data Synthesis System Seyed Ali Etemad and Gabriel A. Wainer (etemad@sce.carleton.ca)	469
Simulation of Vertical Handover Algorithms with NCTUns Alexander García, Lina Escobar, Andres Navarro, Adriana Arteaga, Fabio Guerrero and Carlos Salazar (anavarro@icesi.edu.co)	475
Executable Architectures Edwin Shuman (ashuman@mitre.org)	483
Applying the TPS method to Modeling and Simulation of Biological Systems Rhys Goldstein, Nada Farran, Hamel Yigang, Sanaa Lissari and Gabriel Wainer (rhys_goldstein@yahoo.com)	498
Modeling of p53 Signaling Pathway Regulation Isaac Barjis, Khalid Samarraï and Ruwaa Samarraï (ibarjis@citytech.cuny.edu)	506
Modeling and Simulation of Cellular Transport Mechanism as a Game Isaac Barjis, David Smith and Walied Samarraï (ibarjis@citytech.cuny.edu)	514
(Symbolic) State-space Inspection of a Class of Dynamic Petri Nets Lorenzo Capra and Walter Cazzola (capra@dico.unimi.it)	522
Synergy of the Reinforcement and Agent-Based Technique for Finding Optimal Solution in a Predefined Interval Blerim Qela and Hussein Mouftah (bqela@site.uottawa.ca)	531
Enhanced Network Modeling in ABSNEC Richard McCourt and Kevin Ng (richard.mccourt@forces.gc.ca)	537
Challenges for the automatic generation of simulation models for production systems Bergmann Soeren and Strassburger Steffen (steffen.strassburger@tu-ilmenau.de)	545
Simulating Windows-Based Cyber Attacks Using Live Virtual Machine Introspection	550

Dustyn A. Dodge, Barry E. Mullins, Gilbert L. Peterson and James S. Okolica (dustyn.dodge@afit.edu)	
A Simulation Approach to Airline Maintenance Manpower Planning Massoud Bazargan (bazargam@erau.edu)	556
Simulation of Markovian models using Bootstrap method Ricardo M. Czekster, Paulo Fernandes, Afonso Sales, Dione Taschetto and Thais Webber (afonso.sales@puccs.br)	564
A Scalable Data Distribution Management Approach Shih-Hsiang Lo and Yeh-Ching Chung (albert@sslslab.cs.nthu.edu.tw)	570
Left Ventricle Wall Motion Estimation in Echocardiographic Images Nadia Souag, Saliha Tamrent, Med Mokhtar Djebbour and Abdelaziz Dahmani (souagn@hotmail.com)	576
Determining Operational Utility of the Cultural Geography Model Lisa Bair and Eric Weisel (lbair@werneranderson.com)	581
MODELING AND SIMULATION OF CONFLICT AND PEACEKEEPING Mamadou Seck (m.d.seck@tudelft.nl)	587
Adding Executable Context to Executable Architectures: Shifting Towards a Knowledge- Based Validation Paradigm for System-of-Systems Architectures Johnny Garcia and Andreas Tolk (johnny@simisinc.com)	593
Multi-Hop Shortest Path Computation for Rotary Wing Search and Rescue Richard McCourt, Slawomir Wesolkowski, Irene Collin and Andrew Billyard (richard.mccourt@forces.gc.ca)	601
DEVS-based Underwater Warfare Simulation Development for Effectiveness Analysis Kyung Min Seo, Jeong Hee Hong, Tag Gon Kim (kmseo@smslab.kaist.ac.kr)	608