

28th European Conference on Modelling and Simulation

(ECMS 2014)

**Brescia, Italy
27 – 30 May 2014**

Editors:

**F. Squazzoni
F. Baronio**

**C. Archetti
M. Castellani**

ISBN: 978-1-63266-876-9

Printed from e-media with permission by:

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



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

Copyright© (2014) by the European Council for Modelling and Simulation
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact the European Council for Modelling and Simulation
at the address below.

ecms@scs-europe.net

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Plenary Talks - Abstracts

Preventing Collapse Of Financial Networks Through Systemic Risk Taxes - Answers From Agent Based Models	
<i>Stefan Thurner</i>	5
Patterns, Protocols, And Predictions: Agent-Based Modelling As A Multi-Scope For Analysing Complex Systems	
<i>Volker Grimm</i>	6
Numerical Simulation Of Surface Gravity Waves	
<i>Miguel Onorato</i>	7

Agent-Based Simulation

Use Of Agent Based Modeling To Simulate Complex Ecological Systems In Contexts With Poor Information; The Case Of The Winton Wetlands In Victoria, Australia	
<i>Luisa Perez-Mujica, Terry Bossomaier, Roderick Duncan, Max C. Finlayson</i>	11
Simulating Daily Mobility In Luxembourg Using Multi-Agent Based System	
<i>Hedi Ayed, Benjamin Gateau, Djamel Khadraoui</i>	18
Agent-Based Control Framework In Jade	
<i>Franco Cicirelli, Libero Nigro, Francesco Pupo</i>	25
Simulating Social Networks In Social Marketing	
<i>Roderick Duncan, Luisa Perez-Mujica, Terry Bossomaier</i>	32

Simulation of Complex Systems and Methodologies

Simulation Of A Muon Based Monitoring System	
<i>Germano Bonomi, Antonietta Donzella, M. Subieta, Aldo Zenoni</i>	41
Towards An Executable Sociotechnical Model For Product Development And Engineering Systems	
<i>Axel Hahn, Juergen Geuter</i>	47

Simulation, Experimental Science and Engineering in Maritime Operations

A Hardware-In-The-Loop Simulator For Offshore Machinery Control System Testing

Johnny Aarseth, Alf Helge Lien, Oyvind Bunes, Yingguang Chu, Vilmar AEsøy57

A Ship Motion Short Term Time Domain Simulator And Its Application To Costa Concordia Emergency Manoeuvres Just Before The January 2012 Accident

Paolo Neri, Mario Piccinelli, Paolo Gubian, Bruno Neri.....64

Interoperability In Co-Simulations Of Maritime Systems

Christoph Dibbern, Axel Hahn, Soeren Schweigert71

Simulation and Visualization for Training and Education

Recycling A Discarded Robotic Arm For Automation Engineering Education

Filippo Sanfilippo, Ottar L. Osen, Saleh Alaliyat81

Modelling And Simulation Of An Offshore Hydraulic Crane

Yingguang Chu, Vilmar AEsøy, Houxiang Zhang, Oyvind Bunes87

A Real-Time UAV INSAR Raw Signal Simulator For HWIL Simulation System

Wei Li, Houxiang Zhang, Hans Petter Hildre94

JIOP: A Java Intelligent Optimisation And Machine Learning Framework

Lars I. Hatledal, Filippo Sanfilippo, Houxiang Zhang101

Enhancing Undergraduate Research And Learning Methods On Real-Time Processes By Cooperating With Maritime Industries

Webjorn Rekdalsbakken, Filippo Sanfilippo.....108

Ballast Water Analysis And Heat Treatment Using Waste Heat Recovery Systems On Board Ships

Yanran Cao, Vilmar AEsøy, Anne Stene.....115

Simulation Challenges In The Development Process Of A Complex Product: Design Of Virtual Electric Sports Car

Eszter Varga, Attila Piros, Balazs Vidovics122

Electrical and Electromechanical Engineering

Determination Of An Optimal Shape Of Rotor For The Synchronous Reactive Frequency Doubler

Aleksandrs Mesnajevs, Elena Ketnere 131

Modelling Of Broadband Electric Field Propagation In Nonlinear Dielectric Media

Matteo Conforti, Fabio Baronio 136

On The Processing Of The Recorded Data For The SF6 Circuit Breakers From The Transformation Substation 110/20/6kV Craiova South

Maria Brojboiu, Virginia Ivanov, Andrei Savescu 142

Design, Simulation And Testing Of Planar Spiral Coils For The Time-Gated Interrogation Of Quartz Resonator Sensors

*Mohamad Farran, Marco Bau, Daniele Modotto, Marco Ferrari,
Vittorio Ferrari* 147

Applications Of The Graph Theory For Optimization In Manufacturing Environment Of The Electrical Equipments

Virginia Ivanov, Maria Brojboiu, Sergiu Ivanov 153

Current Control Of A VSI-FED Induction Machine By Predictive Technique

*Sergiu Ivanov, Vladimir Rasvan, Eugen Bobasu, Dan Popescu,
Florin Stinga* 159

Modeling And Control Of Berry Phase In Quantum Dots

Sanjay Prabhakar, Roderick Melnik, Ali Sebetci 166

Efficient Modeling Of Graphene Based Optical Devices

Costantino De Angelis, Andrea Locatelli 171

Simulation in Industry, Business and Services

A Simulation Study: The Business Value Of E-Business For A Maintenance Provider

Orit Raphaeli, Liron Rosenfeld, Lior Fink, Sigal Berman..... 179

Strategic Information Systems Planning As A Dynamic Capability: Insights From An Agent-Based Simulation Study

Daniel Fuerstenau, Johannes Schinzel, Catherine Cleophas..... 185

Extended Neonatal Metabolic Screening By Tandem Mass Spectrometry: Models And Simulation Of Alternative Management Solutions

Arturo Liguori, Giorgio Romanin-Jacur..... 193

The Influence Of Changing Environment For Path Dependence In Hierarchical Organizations

Arne Petermann, Alexander Simon..... 202

HCCM - A Control World View For Health Care Discrete Event Simulation

*Nikolaus Furian, Michael O'Sullivan, Cameron Walker,
Siegfried Voessner*..... 206

Towards A Simulation Model Of Partner-Specific Absorptive Capacity As A Path Dependent Self-Reinforcing Mechanism In B2B Relationships

Tobias Grossmann, Arne Petermann..... 214

Simulation Of Scheduling And Cost Effectiveness Of Nurses Using Domain Transformation Method

Geetha Baskaran, Andrzej Bargiela, Rong Qu 226

Emergency Department: A General Adaptable Simulation Model Implemented In Arena

Arturo Liguori, Giorgio Romanin-Jacur..... 235

Modelling, Simulation and Control of Technological Processes

Nonlinear Control Of A Shell And Tube Heat Exchanger <i>Petr Dostal, Vladimir Bobal, Jiri Vojtesek</i>	247
Digital Linear Quadratic Smith Predictor <i>Vladimir Bobal, Marek Kubalcik, Petr Dostal, Stanislav Talas</i>	254
Simulation Of Multivariable Continuous-Time Decoupling Control <i>Marek Kubalcik, Vladimir Bobal</i>	261
Use of Dynamic Matrix Control in Simulation of Heat System <i>Stanislav Talas, Vladimir Bobal, Adam Krhovjak</i>	267
Multivariable Adaptive Control Of Two Funnel Liquid Tanks In Series <i>Adam Krhovjak, Petr Dostal, Stanislav Talas</i>	273
Modeling Of Alcohol Fermentation In Brewing – Carbonyl Compounds Synthesis And Reduction <i>Vessela Naydenova, Vasil Iliev, Maria Kaneva, Georgi Kostov Petia Koprinkova-Hristova, Silviya Popova</i>	279
Robust Process Control With Saturated Control Input <i>Frantisek Gazdos, Jiri Marholt</i>	285
Computational Model For Spray Quenching Of A Heavy Forging <i>Mahdi Soltani, Annalisa Pola, Giovina Marina La Vecchia</i>	292
Modelling And Simulation Of Water Tank <i>Jiri Vojtesek, Petr Dostal, Martin Maslan</i>	297
The Effect Of Initial Estimated Points On Objective Functions For Optimization <i>Mahdi Soltani, Annalisa Pola, Qiang Xu</i>	304
Estimation Of The Dynamic Effect In The Lifting Operations Of A Boom Crane <i>Luigi Solazzi, Giovanni Incerti, Candida Petrogalli</i>	309

Simulation of Intelligent Systems

Towards Evolutionary Deep Neural Networks

*Tomas H. Maul, Andrzej Bargiela, Siang-Yew Chong,
Abdullahi S. Adamu*319

Model Of Intellectual Visualization Of Geoinformation Service

*Stanislav L. Belyakov, Alexander V. Bozhenyuk,
Marina L. Belykova, Igor N. Rozenberg*326

Advantages Of Using Memetic Algorithms In The N-Person Iterated Prisoner's Dilemma Game

*Tamara Alvarez, Miguel Loureiro, Jose Covelo, Ana Peleteiro,
Aleksander Byrski, Juan C. Burguillo*333

A Comparative Study To Evolutionary Algorithms

Eva Volna, Martin Kotyrba340

Comparison Of Modern Clustering Algorithms For Two-Dimensional Data

Martin Kotyrba, Eva Volna, Zuzana Kominkova Oplatkova.....346

Reusable Reinforcement Learning for Modular Self Motivated Agents

Jaroslav Vitku, Pavel Nahodil352

Routing And Communication Path Mapping In VANETS

Nnamdi Anyameluhor, Evtim Peytchev.....359

Modelling Retinal Feature Detection With Deep Belief Networks In A Simulated Environment

Diana Turcsany, Andrzej Bargiela, Tomas Maul.....364

Performance Comparison Of Evolutionary Techniques Enhanced By Lozi Chaotic Map In The Task Of Reactor Geometry Optimization

Michal Pluhacek, Roman Senkerik, Ivan Zelinka, Donald Davendra371

Analysis Of EEG Signal For Using In Biometrical Classification

Roman Zak, Jaromir Svejda, Roman Senkerik, Roman Jasek377

Using Artificial Neural Network For The Kick Techniques Classification – An Initial Study

*Dora Lapkova, Michal Pluhacek, Zuzana Kominkova Oplatkova,
Milan Adamek*.....382

Pseudo Neural Networks For Iris Data Classification

Zuzana Kominkova Oplatkova, Roman Senkerik, Ales Kominek.....387

Simulation Of The Differential Evolution Performance Dependency On Switching Of The Driving Chaotic Systems	
<i>Roman Senkerik, Michal Pluhacek, Donald Davendra, Ivan Zelinka, Zuzana Kominkova Oplatkova</i>	393

Modelling and Simulation in Robotic Applications

Gyroscopic Precession In Motion Modelling Of Ball-Shaped Robots	
<i>Tomi Ylikorpi, Pekka Forsman, Aarne Halme</i>	401
Unified Representation Of Decoupled Dynamic Models For Pendulum-Driven Ball-Shaped Robots	
<i>Tomi Ylikorpi, Pekka Forsman, Aarne Halme, Jari Saarinen</i>	411
Integrating Simulation With Robotic Learning From Demonstration	
<i>Anat Hershkovitz Cohen, Sigal Berman</i>	421

Discrete Event Modelling and Simulation in Logistics, Transport and Supply Chain Management

Improving The Distribution Planning Process In The Food&Beverage Industry: An Empirical Case Study	
<i>Andrea Bacchetti, Massimo Zanardini</i>	431
A Timed Petri Net Model For The Quay Crane Scheduling Problem	
<i>Roberto Trunfio</i>	441
Determining Transportation Mode Choice To Minimize Distribution Cost: Direct Shipping, Transit Point And 2-Routing	
<i>Luca Bertazzi, Jeffrey Ohlmann</i>	448
Process Modelling And Simulation For Medication-Use Process	
<i>Johan Royer, Michelle Chabrol, Jean-Luc Paris</i>	454
A Scor Based Analysis Of Simulation In Supply Chain Management	
<i>Wolfgang Kersten, Muhammad Amad Saeed</i>	461

High Performance Modelling and Simulation

Modelling and Simulation of Data Intensive Systems Special Session

Implementation Of The Genetic Algorithm By Means Of CUDA Technology Involved In Travelling Salesman Problem

Anna Plichta, Tomasz Gaciarz, Bartosz Baranowski, Szymon Szominski475

Workload Characterization Of Multithreaded Applications On Multicore Architectures

Davide Cerotti, Marco Gribaudo, Mauro Iacono, Pietro Piazzolla480

Dynamic Factory - New Possibilities For Factory Design Pattern

Dawid R. Ireno487

Memetic Computing In Selected Agent-Based Evolutionary Systems

Aleksander Byrski, Marek Kisiel-Dorohinicki495

Optimal Pump Scheduling By NLP For Large Scale Water Transmission System

Jacek Blaszczyk, Krzysztof Malinowski, Alnoor Allidina501

Hybrid CPU/GPU Platform For High Performance Computing

Michal Marks, Ewa Niewiadomska-Szynkiewicz508

Using Artificial Neural Network For Monitoring And Supporting The Grid Scheduler Performance

Daniel Grzonka, Joanna Kolodziej, Jie Tao515

Hybrid Architecture For Simulation Of Blood Flow With Foreign Bodies

Lukasz Faber, Krzysztof Boryczko, Marek Kisiel-Dorohinicki523

Realistic Mobility Simulator For Smart Traffic Systems And Applications

Cosmin-Stefan Stoica, Ciprian Dobre, Florin Pop530

Research and Use of Multiformalism Modeling Methods Special Session

Multi-Formalism Modeling For Evaluating The Effect Of Cyber Exploits

Alexander H. Levis, Bahram Yousefi541

Probability and Statistical Methods for Modelling and Simulation of High Performance Information Systems Special Session

Analysis Of A FCFS Queue With Two Types Of Customers And Order-Dependent Service Times

*Bert Reveil, Dieter Claeys, Tom Maertens, Joris Walraevens,
Herwig Bruneel*551

Joint Stationary Distribution Of Queues In Homogenous M|M|3 Queue With Resequencing

Ilaria Caraccio, Alexander V. Pechinkin, Rostislav V. Razumchik558

Generation Of Probability Measures With The Given Specification Of The Smallest Bans

Alexander A. Grusho, Nick A. Grusho, Elena E. Timonina565

On The Development Of An Information Technology For Plasma Turbulence Research

*Andrey Gorshenin, Victor Korolev, Dmitry Malakhov,
Nina Skvortsova, Sergey Ya. Shorgin, Victor Kuzmin*570

On Truncations For SZK Model

*Alexander Zeifman, Yakov Satin, Galina Shilova, Victor Korolev,
Vladimir Bening, Sergey Ya. Shorgin*577

On Convergence Of The Distributions Of Random Sums And Statistics Constructed From Samples With Random Sizes To Exponential Power Laws

Victor Korolev, Maria E. Grigoryeva, Alexander Zeifman583

Transfer Theorem Concerning Asymptotic Expansions For The Distribution Functions Of Statistics Based On Samples With Random Sizes

*Vladimir Bening, Vladislav A. Savushkin, Egor I. Shunkov,
Alexander Zeifman, Victor Korolev*590

Variance-Mean Mixtures As Asymptotic Approximations

*Victor Korolev, Vladimir Bening, Andrey Gorshenin,
Maria Grigoryeva, Alexander Zeifman*596

Analytical Modelling And Simulation For Performance Evaluation Of SIP Server With Hysteretic Overload Control

*Konstantin E. Samouylov, Pavel O. Abaev, Yuliya V. Gaidamaka,
Alexander V. Pechinkin, Rostislav V. Razumchik*603

Simulation and Optimization

Regulation Of The Input Flow Of Supply Chains To Optimize The Production <i>Ciro D'Apice, Carmine De Nicola, Rosanna Manzo</i>	613
Seasonal Trends In Supply Chains <i>Hans-Peter Barbey</i>	620
The Tyche And Safe Models: Comparing Two Military Force Structure Analysis Simulations <i>Cheryl Eisler, Slawomir Wesolkowski, Daniel T. Wojtaszek</i>	625
Modeling Optimal Allocation Centers In GIS By Fuzzy Base Set Of Fuzzy Interval Graph <i>Leonid S. Bershtein, Alexander V. Bozhenyuk, Stanislav L. Belyakov, Igor N. Rozenberg</i>	633
Approaches To Run Simulations Of Business Processes In A Grid Computing Network <i>Christian Mueller</i>	639
Optimisation Of Boids Swarm Model Based On Genetic Algorithm And Particle Swarm Optimisation Algorithm (Comparative Study) <i>Saleh Alaliyat, Harald Yndestad, Filippo Sanfilippo</i>	643
Modelling Of Photovoltaic Energy Generation Systems <i>Pekka Ruuska, Antti Aikala, Robert Weiss</i>	651
Genetic Algorithm With Simulation For Scheduling Of A Flow Shop With Simultaneously Loaded Stations <i>Frank Herrmann</i>	657
MapReduce Based Experimental Frame for Parallel and Distributed Simulation Using Hadoop Platform <i>Byeong Soo Kim, Sun Ju Lee, Tag Gon Kim, Hae Sang Song</i>	664
Deriving A Mathematical Model Of A Paint Shop From Data Analysis <i>Thomas Husslein, Christian Danner, Markus Seidl, Joerg Breidbach, Wolfgang Lauf</i>	670
Multi-Criteria Approach For Emergency Service Orders In Electric Utilities <i>Vinicius Jacques Garcia, Daniel Pinheiro Bernardon, Alzenira Abaide, Julio Fonini</i>	676

An Improved Receding Horizon Genetic Algorithm For The Tug Fleet Optimisation Problem	
<i>Robin T. Bye, Hans G. Schaathun</i>	682

The Value Of Integration In Logistics	
<i>Claudia Archetti, M. Grazia Speranza</i>	691

Finance, Economics and Social Science

Petri Nets As Tools For Policy Analysis: The Example Of Smoking Bans In Public Places	
<i>Georg P. Mueller</i>	701

The Association Between Group Size And Communicational Complexity According To Conceptual Agreement Theory	
<i>Enrique Canessa, Carlos Barra, Sergio E. Chaigneau, Ariel Quezada</i>	709

The Dangers Of Ethnocentrism	
<i>Giangiaco Bravo</i>	718

Do Editors Have A Silver Bullet? An Agent-Based Model Of Peer Review	
<i>Juan Bautista Cabota, Francisco Grimaldo, Flaminio Squazzoni</i>	725

Learning not to Trade: On Scarcity, Emergence and Failure of Markets	
<i>Oezge Dilaver</i>	732

Degree Variance And Emotional Strategies Catalyze Cooperation In Dynamic Signed Networks	
<i>Simone Righi, Karoly Takacs</i>	738

A Social Interaction Model For Crime Hot Spots	
<i>Evan C. Haskell</i>	745

The Definition Of Stress Situations And Their Prediction Using Liquidity In The Framework Of The EMIR Regulation	
<i>Barbara Doemoetoer, Kata Varadi</i>	752

Path Dependency In Investment Strategies – A Simulation Based Illustration	
<i>Agnes Vidovics-Dancs, Peter Juhasz, Janos Szaz</i>	758

Modelling The Collapse Of A Criminal Network	
<i>Martin Neumann, Ulf Lotzmann</i>	765

Policy Modelling

Integrating Optimisation And Agent-Based Modelling

Peter George Johnson, Tina Balke, Lars Kotthoff.....775

Towards An Agent-Based Model On Co-Diffusion Of Technology And Behavior: A Review

Thorben Jensen, Emile Chappin.....782

Scenario Analysis And Optimization Approach In Air Quality Planning: A Case Study In Northern Italy

*Claudio Carnevale, Giovanna Finzi, Anna Pederzoli, Enrico Turrini,
Marialuisa Volta*789

Tactical Versus Operational Discrete Event Simulation: A Breast Screening Case Study

Andrea Lodi, Paolo Tubertini, Roberto Grilli, Francesca Senese.....796

Author Index803