

<b>Preface</b> .....	<b>IX</b>
<b>Scientific Programme</b> .....	<b>1</b>
<b>Author Listing</b> .....	<b>363</b>

## INVITED SPEECH

<b>Looking for Intelligent Reconfigurable Simulation</b> Tudor Niculiu, Anton Manolescu and Sorin Cotofana.....	<b>5</b>
--	----------

## TUTORIAL

<b>Grid Computing and Stochastic Distributed Simulation</b> David R.C.Hill.....	<b>15</b>
--	-----------

## SIMULATION METHODOLOGY

### METHODOLOGY

<b>Knowledge integrating in Situative modeling System for nature Technical Complexes</b> Alexander Fridman, Andrey Oleynik and Olga Fridman.....	<b>25</b>
---	-----------

<b>Flexible Hierarchical Architecture of Simulation Models</b> Norbert Adamko, Valent Klima, Michal Lekýr and Antonin Kavička .....	<b>30</b>
--	-----------

<b>An Open Source Object-Oriented Architecture for discrete event simulation</b> L. Castelluzzo, A. Grieco, F. Nucci, S. Zacchino and A. Anglani.....	<b>35</b>
--	-----------

<b>A Heuristic Volume Selection in Dimensional Bounding as an Accelerating Technique in a Ray Tracing</b> D. Benyamina and N.Hallam.....	<b>43</b>
---	-----------

<b>Static and Dynamic Equal opportunity Evaluation</b> Ignacio J. Benítez, José L. Díez, Juan A. Lacort and Pedro Albertos .....	<b>48</b>
---	-----------

<b>Discovery of New Global Minima for Lennard – Jones Atomic Clusters Using TRUST Simulations</b> Jacob Barhen, Vladimir Protopopescu, Gabriel Amselem, Julien Dahan Christopher Randall and Zachary Vane .....	<b>53</b>
---	-----------

# CONTENTS

## **A simulation Based Value Stream Mapping Formal Method for Lean Implementation: Atoms, Database and Model generator**

Yang-Hua Lian and Hendrik Van Landeghem..... 58

## **Partitioning and Modular Code Synthesis for Reconfigurable mechatronic Software Components**

Sven Burmester, Holger Giese, Alfonso Gambuzza and Oliver Oberschelp ..... 66

## **A Dynamic Type Changes Model for Adaptive Simulation Environments based on Virtual Machine Meta Model**

Cristina Mîndruță..... 74

## **A methodology to reduce the design lifecycle of real-time embedded control systems**

Remy Kocik and Yves Sorel ..... 79

# QUEUEING SYSTEMS SIMULATION

## **Combination and Interworking of Traffic Flow Analysis and Event Driven Discrete Event Simulation**

Gábor Lencse..... 89

## **Reflective Simulation Models for Optimization of FMS**

Eugene Kindler, Ivan Křivý, Philippe Lacomme and Alain Tanguy ..... 94

## **Visual Dynamic Modeling of Transport Flows For Electronic Business Problems**

Anatoly Levchenkov and Andrew Mor-Yaroslavtsev..... 99

## **On Measuring the Supply Chain Flexibility**

J. Manuel Feliz Teixeira and António E. S. Carvalho Brito..... 103

# SIMULATION TOOLS

## **Extending Scicos from system to component level simulation**

Masoud Najafi, Azzedine Azil and Ramine Nikoukhah ..... 111

## **An I/O Simulator for Windows Systems**

Jalil Boukhobza and Claude Timsit..... 116

## **DACSIM: A Data Acquisition Card Simulator**

Antonio Martí, Salvador Coll, Marina Alonso and Juan Jose Serrano ..... 122

## **JARA 2i – A MODELICA Library for Interactive Simulation of Physical Chemical Processes**

Carla Martin, Alfonso Urquia and Sebastian Dormido ..... 128

## **SIMULATION IN BIOLOGY**

### **Motor Output Variability in a Joint Control Systems – A Simulation Study**

Oliver Straub, Wolfgang Mader, Jessica Ausborn and Wolfgang Stein ..... 135

### **Combining Simulated Biological Components to achieve a Powerful Simulation Environment**

Michael Schmid and Jens Kohlmeyer ..... 140

### **Neural Network Based Model to Flow Cytometric Data Interpretation**

G.C. Pereira, A. Bonomo and N.F.F.Ebecken..... 143

### **Analog Modulation of Digital Computation in Nerve Cells Simulating the Stomatogastric Nervous System of the Crab**

Wolfgang Stein and Jessica Ausborn ..... 148

### **Cardiac Resynchronization Therapy by Biventricular Stimulation: Analysis and Models of Patient Management**

Sara Bertolino, Stefano Pasinato and Giorgio Romanin-Jacur ..... 153

## **MARINE ENVIRONMENT SIMULATION**

### **Modelling of Solute Dispersion in Estuaries – mathematical Techniques and Computer Implementation**

Naghmeh Keshavarzi-Rooniz, Rahim Ghorashi and Vahid Nassehi ..... 159

### **Methodology for Holarchic Ecosystem Model based on Ontological tool**

Guillaume Prevost, Pierrick Tranouez, Sylvain Lerebourg, Cyrille Bertelle and Damien Olivier. .... 164

### **Model of the nitrogen fixation process in Marine Cyanobacteria**

Sophie Rabouille, Karline Soetaert and Marc Staal ..... 172

### **Towards a Framework for Multi-scale Models of Freshwater Fishes**

Nicolas Dumoulin..... 175

# CONTENTS

## ANALYTICAL AND NUMERICAL MODELLING TECHNIQUES

- Stiffness Modelling of Rubber Engine Mounts by Polynomial Neural Networks and Genetic Algorithms**  
N. Nariman-zadeh, J. Marzbanrad and A. Jamali..... 181
- Person Centered Simulation of Product Development using Timed Stochastic Coloured Petri Nets**  
Torsten Licht , Lothar Dohmen , Peter Schmitz, Ludger Schmidt  
and Holger Luczak ..... 188
- Queueing networks models of out-patient clinics and hospitals**  
Bogusław Filipowicz and Joanna Kwiecień..... 196
- Evaluation of Flows in Communication Networks with different Mechanisms for Support of Quality of Service**  
Daniela Traczinski, Wolfram Luther, Nicola Ehling and Gerhard Haßlinger ..... 201
- Performance Evaluation of Software Architectures with Queueing Network Models**  
Simonetta Balsamo Roberto Mamprin and Moreno Marzolla ..... 206
- Performance Evaluation of OADR Mechanism using Non-Markovian SPN**  
Mohamed Escheikh, Jouda Maatoug and Kamel Barkaoui..... 214
- Modeling Distributed Supervisory Systems using a Modular Multi-Formalism Methodology**  
Mauro Iacono, Stefano Marrone, Nicola Mazzocca and Francesco Moscato ..... 220
- 
- ## HIGH PERFORMANCE COMPUTING SIMULATION
- Combining GLOBUS and MOSIX for MPI Calculations**  
Adam Kozakiewicz, Andrzej Karbowski and Krzysztof Malinowski ..... 229
- Load Balancing for a Parallel Joint Diagonalization of Symmetric Matrices**  
Ales Holobar, Milan Ojstersek and Damjan Zazula..... 234
- A Web Based Approach to distribute simulation based fault injections campaigns**  
Miguel Mateo Pla, David de Andres, Juan Carlos Baraza, Lenin Lemus  
and Pedro Gil..... 239

**AGENT BASED AND NEURAL NET SIMULATION**

**A tool for supporting the Development of Correct Mobile Applications based on Higher Order  $\pi$ -Calculus**  
 Andreea Barbu..... 247

**Simulation of Business Process Improvement by a Customized Genetic Algorithm**  
 Cornelia-Richter von Hagen, Dietmar Ratz and Wollfried Stocky ..... 252

**Simulation Routines for Teaching and training the Power System Managers**  
 Eugeniusz M. Sroczan and Andrzej Urbaniak ..... 257

**PETRI NETS SIMULATION**

**Tolerance analysis Approach with Interval Constrained Petri Nets**  
 S. Collart Dutilleul., H. Dhouibi and E. Craye..... 265

**Multilayer decomposition of Stochastic Petri Nets and Algebraic specifications**  
 Nabila Salmi and Malika Ioualalen ..... 272

**Evaluation of maintenance process of electrical power plants, using Petri Nets**  
 Vrassidas Leopoulos, Charalampos Tsogkas, Evaggelos Champilomati  
 and Konstantinos Kirytopoulos ..... 280

**Towards the automated Construction of Multi-Component Petri Nets Models of Supply Chains**  
 Carmen Veronica Bobeanu and Hendrik Van Landeghem ..... 284

## **CONTENTS**

<b>Generating Coloured Petri Nets of Concurrent Object-oriented Programs</b> Cecile Bui Thanh.....	<b>289</b>
---	------------

<b>Simulation and detection of some properties of hybrid system based Differential Predicate-Transition Petri Nets by means of VHDL-AMS</b> A. Nketsa, J.C. Pascal, D. Andreu and P. Esteban .....	<b>294</b>
---	------------

## **FLUID FLOW SIMULATION**

<b>CANDU Steam Generators Modeling Using CompGen for MMS Package</b> Ilie Prisecaru, Daniel Dupleac and Adrian Constantinescu.....	<b>301</b>
---	------------

<b>Modelling of Layered Microfluid Flow in Conical Nozzle and Diffuser</b> Manisah Aumeerally and Renate Sitte .....	<b>306</b>
---	------------

**LATE PAPERS**

**Streams of Events and Performance of Queueing Systems; the basic Anatomy of arrival departure processes, when the focus is set on autocorrelation**  
 Erland Hejn Nielsen ..... 313

**Performance Evaluation in Steel Manufacturing: A Case Study with Simulation**  
 Adil Bellabdaoui..... 320

**Multilayer Agent-Based Model for Decision Support System Using Psychological Structure and Emotional states**  
 Joël Colloc and Cyrille Bertelle..... 325

**OTHER PAPERS**

**Comparison of Models to describe Crystallization Kinetics of Fats**  
 Imogen Foubert, Peter A. Vanrolleghem and Koen Dewettinck..... 333

**Experimental and CFD Study of Power Consumption with Gate Agitators: Effects of Bottom Clearance and Scale Up**  
 Guillaume Delaplace, Romuald Guérin, Anne Moreau, Claude Torrez, Christophe André and Jean-Claude Leuhet..... 338

**Aircraft Performance Simulation utilizing Thrust Vectoring**  
 Assim H.Youssif, Arif A.Al-Qassar and Wisam A.F.Mohammed ..... 345

**A Training Algorithm for Partial Recurrent Neural Networks**  
 Mnaiad Shawqi Murad Al-Faysale..... 350

**Design of a Neuro-Fuzzy Controller for Water-Level Tank utilizing Genetic Algorithms**  
 Mohammed Z. Al-Faiz and Sawsan Kamal ..... 355