## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>IX</td>
</tr>
<tr>
<td>Scientific Programme</td>
<td>1</td>
</tr>
<tr>
<td>Author Listing</td>
<td>443</td>
</tr>
<tr>
<td><strong>SIMULATION ESTIMATION, VALIDATION AND OPTIMIZATION</strong></td>
<td></td>
</tr>
<tr>
<td>Efficient Truncation Point Estimation for Arbitrary Performance Measures</td>
<td>5</td>
</tr>
<tr>
<td>Mirko Eickhoff, Donald C. McNickle and Krzysztof Pawlikowski</td>
<td></td>
</tr>
<tr>
<td>Deploying Validation Tests in Systems Development</td>
<td>13</td>
</tr>
<tr>
<td>Juan Garbajosa and Pedro P. Alarcón</td>
<td></td>
</tr>
<tr>
<td>SOM-Validation Method for Wastewater Treatment</td>
<td>17</td>
</tr>
<tr>
<td>Hilario López and Iván Machón</td>
<td></td>
</tr>
<tr>
<td>Simulation based Framework for Maintenance Optimization</td>
<td>23</td>
</tr>
<tr>
<td>Thibaut Lust, Olivier Roux, Fouad Riane and Pierre Dehombreux</td>
<td></td>
</tr>
<tr>
<td>Computing Simulation and Heuristic Optimization of the Marine Twin Shaft Gas Turbine</td>
<td>28</td>
</tr>
<tr>
<td>Josko Dvornik, Ante Munitic and Enco Tireli</td>
<td></td>
</tr>
<tr>
<td><strong>NEURAL NETWORK AND GENETIC ALGORITHM SIMULATION</strong></td>
<td></td>
</tr>
<tr>
<td>Corti’s Organ Physiologist-based Cochlear Model: Neural lateral Inhibition</td>
<td>33</td>
</tr>
<tr>
<td>Francisco Ríos, Raquel Fernández-Ramos, Jorge Romero-Sánchez, Jose Francisco Martín, A.Ignacio Molina-Conde and Francisco Javier Marín</td>
<td></td>
</tr>
<tr>
<td>Rule Representation and Initial Population in Genetic Learning</td>
<td>37</td>
</tr>
<tr>
<td>I. Bruha</td>
<td></td>
</tr>
<tr>
<td><strong>VISUAL SIMULATIONS</strong></td>
<td></td>
</tr>
<tr>
<td>A Simplified Aerodynamic Model for Flight Simulation</td>
<td>45</td>
</tr>
<tr>
<td>H. Chen, T.R. Wan and R.A. Earnshaw</td>
<td></td>
</tr>
<tr>
<td>3D Visualisation of Musical Content</td>
<td>50</td>
</tr>
<tr>
<td>Jacek Grekow</td>
<td></td>
</tr>
</tbody>
</table>
CONTENTS

A Knowledge Representation System to support Medical Diagnostic Imaging
Edoardo Ardizzone and Daniele Peri .................................53

Dynamic Generation of Hypermedia Presentations from Distributed Digital Archives
Chia-Hung Lin, Chia-Hung Yeh, Bai-Hsuen Chen and Jen-Shin Hong 58

SIMULATION IN ROBOTICS

Using „Complete Kinematical Structure” in a Faster Method for Robot Kinematic Modelling
Viorel Stoian ........................................................................63

Simulation of mobile Robot Applications with VirtualRobot
Martin Mellado, Carlos Correcher, Rosa Mª de Molina, José Camacho and Ginés Benet ......................................................68

Pathfinding with Kohonen Maps
Matthias Reuter and Steffen Harneit ..................................73

Extraction of System Parameters and Their Importance for Controlling
Matthias Reuter and Sabine Bostelmann ................................78

ELECTRONICS PERFORMANCE ANALYSIS AND OPTIMIZATION

Clustering Procedure for Performance Analysis of Mobile Communication Networks
Dimitar Radev, Izabella Lokshina and Svetla Radeva ..................83

A Measurement Based Simulation Model of a Web Cluster
Isabel Wagner, Kai-Steffen Hielscher and Reinhard German ....88

NAPT- A Simulation Tool for Network Analysis and Parameter Tuning
Mario Barbera, Andrea G. Busà, Alessandro G. Di Nuovo, Alfio Lombardo and Giovanni Schembra .........................93

Optimizers with learning Distributions in Simulation: An Application
All-Pass Disperser Compensator of Optic Filters
Mufit Ozden and Chi-Hao Cheng ........................................101
CONTENTS

MANAGEMENT SIMULATION TOOLS

Blended Learning Applying Interactive Discrete Event Simulation in a Web Based Learning Management System
Wolfgang Kühn .................................................................................................................109

PLANSIM, A framework to build Automated Planners with Simulators
Ruy L. Milidu and Frederico dos Santos Liporace.........................................................115

A Virtual Real-Time Model for Control Software Development –Applied on a Sheet Metal Press Line
Bo Svensson, Fredrik Danielsson and Bengt Lennartson.............................................119

Enterprise Petri net based CAM software Opera-Topaz
Dmitry Zaitsev, ..................................................................................................................124

Soleil: modeling a Health System
Ruben Gonzalez-Rubio and Lourdes Zubieta.................................................................129

A Simulation System with Neural Data Interface for Shipbuilding Operation
Guodong Shao, Charles McLean and Swee Leong.........................................................137

ENTERPRISE AND MANAGEMENT SIMULATION

Virtual Enterprise Risk and Security Management
Tomas Feglar.......................................................................................................................145

D-Fact Insight – Simulation of Huge Scale Models in Cooperative Work
Kiran Mahajan, Daniel Huber, Bengt Mueck and Wilhelm Dangelmaier .................150

ENTERPRISE AND MANAGEMENT SIMULATION

BetaSIM Extended Framework for General Discrete Event Simulation
František Huňka..................................................................................................................159

Achieving efficiency through Simulation in a declining Manufacturing Market
Rob Walker, Habtom Mebrahtu and Caroline Strange..................................................162

Visualizing Lean Effects with Simulation-Based Value Stream Mapping
Yang-Hua Lian and Hendrik Van Landeghem ...............................................................168

OEE Simulation in Production Ramp-up
Jürgen Fleischer; Gisela Lanza and Thomas Ender ......................................................173
CONTENTS

PRODUCTION PLANNING AND JOB SHOP SIMULATION

The Impact of Human Performance Variation on the Accuracy of a Job Shop Simulation
Peter Lawrence ..................................................................................................................181

A Simulation Application Framework for Production Planning and Scheduling
Hans P.M. Veeke and Gabriel Lodewijks ..............................................................187

An Event Driven Approach to Workflow Simulation
Agustín Yagüe, Pedro Pablo Alarcón, Juan Garbajosa, Jessica Díaz and José Luis Esteban .................................................................193

AUTOMOTIVE PRODUCTION SYSTEM SIMULATION

Simulation validates Design and Scheduling of a Production Line
Vidyasagar Murty, Neelesh A. Kale, Rohit Trivedi, Omar M. Ulgen and Edward J. Williams .................................................................201

Bezier Curves for Representing Clothoids, Circles and Straight Lines
N. Montés, J. Tornero and L. Arnesto ........................................................................206

Genetic Algorithm Based Optimization of Model Reference Adaptive Control Approach for Vehicle Active Suspension System
Ahmad Bagheri, Moussa Rezaee and S. Mehdi Hashemi ..............................................211

Using Modelling Techniques For Fault Prediction In Hydraulic Drive Systems
C. Angeli and A. Chatzinikolaou ..................................................................................216

Design of a Custom Plowing Process using Simulation
Allan Burke, Víctor Acosta, José Carlos Miranda and Juan de Dios Calderón ..................................................................................221

FACTORY WAREHOUSE AND STORAGE MANAGEMENT SIMULATIONS

Greenhouse Automation: A Model for Design and Evaluation
Jaap A. Ottjes, Joan C. Rijksenbrij and Auke Groenenboom ................................227

Pervasive Items for Factory Security
Alessandro Genco, Gaspare Scherma and Salvatore Sorce ...................................231

AutoTrans: Management and Transport Automation in Warehouses
Leopoldo Armesto and Josep Tornero ......................................................................236
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtainer: Graphical Simulation of Container Storage Yard</td>
<td>242</td>
</tr>
<tr>
<td>Miguel Escriva, Marcos Marti, Jose Manuel Sanchez, Emilio Camahort,</td>
<td></td>
</tr>
<tr>
<td>Javier Lluch and Roberto Vivó</td>
<td></td>
</tr>
<tr>
<td>SUPPLY CHAIN SIMULATION</td>
<td></td>
</tr>
<tr>
<td>A Methodology for Supply Chain System Modeling and Process Evaluation</td>
<td>251</td>
</tr>
<tr>
<td>M.Chabroll, M.Comelli, P.Féniès and N.Tchernev</td>
<td></td>
</tr>
<tr>
<td>A Modelling Framework for Supply Chain Planning Simulation under</td>
<td>256</td>
</tr>
<tr>
<td>Uncertainty</td>
<td></td>
</tr>
<tr>
<td>François Galasso, Colette Mercé and Bernard Grabot</td>
<td></td>
</tr>
<tr>
<td>The Impact of Various Delivery Prioritization Strategies in</td>
<td>262</td>
</tr>
<tr>
<td>heterogeneous Supply Chain Environments</td>
<td></td>
</tr>
<tr>
<td>Thomas Thron, Gábor Nagy and Niaz Wassan</td>
<td></td>
</tr>
<tr>
<td>Decision Support System for Plant Location Analysis Based on Fuzzy</td>
<td>269</td>
</tr>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Francesco Costantino, Giulio Di Gravio and Massimo Tronci</td>
<td></td>
</tr>
<tr>
<td>TRAFFIC SIMULATION</td>
<td></td>
</tr>
<tr>
<td>Basic Aspects of Transport Demand Modelling</td>
<td>277</td>
</tr>
<tr>
<td>Nina Kudlackova and Alexander Chlaň</td>
<td></td>
</tr>
<tr>
<td>Research Project Theory of Transport Systems</td>
<td>281</td>
</tr>
<tr>
<td>Karel Šotek and Alexander Chlaň</td>
<td></td>
</tr>
<tr>
<td>Part 1 Approach and Algorithms</td>
<td></td>
</tr>
<tr>
<td>Daniel Krajzewicz, Georg Hertkorn, Julia Ringel and Peter Wagner</td>
<td></td>
</tr>
<tr>
<td>Urban Traffic Simulation Modeling for Reconfigurable Hardware</td>
<td>291</td>
</tr>
<tr>
<td>Anders Å. Hansson, Henning S. Mortveit Justin L. Tripp</td>
<td></td>
</tr>
<tr>
<td>and Maya B. Gokhale</td>
<td></td>
</tr>
<tr>
<td>Simulation of modern Traffic Lights Control Systems using the open</td>
<td>299</td>
</tr>
<tr>
<td>source Traffic Simulation SUMO</td>
<td></td>
</tr>
<tr>
<td>Daniel Krajzewicz, Elmar Brockfeld, Jürgen Mikat, Julia Ringel,</td>
<td></td>
</tr>
<tr>
<td>Christian Rössel, Wolfram Tuchscheerer, Peter Wagner, Richard</td>
<td></td>
</tr>
<tr>
<td>Wösler</td>
<td></td>
</tr>
</tbody>
</table>
## CONTENTS

### ENERGY SYSTEMS SIMULATION

Integration of a Hydrogen Economy into the German Energy System: an Optimising, Modelling Approach  
Michael Ball, Otto Rentz and Martin Wietschel ..................................................305

Feasibility Study of Static Field Converter  
Anil Puppala, Mohammed Soliman, Mohammed Safiuddin and Andrew Abolafia ..........................................................310

Simulation of the Steam Condenser in MATLAB Environment  
Milan Cepák ........................................................................................................314

Object-Oriented Database Management System for Industrial Combustion Processes  
Nuray Kayakol and Marcus A. Nogueira ....................................................................319

Computer Simulation Model of the Marine Diesel Engine  
Josko Dvornik, Luko Milic and Enco Tireli ..............................................................325

### SIMULATION IN PROCESS INDUSTRY

Numerical Modelling and Analysis of Flow and Heat Transfer Processes in a Coke Oven  
K. Hellgardt, K. J. Vyas, N. S. Hanspal and V. Nassehi ........................................331

Influence Spare Parts Supply on Modeling Maintenance Organization  
Petar Stanojević, Vasilije Mišković, Vladimir Bukvić and Mirjana Misita ........337

Using Simulation to Analyse the Procurement of Additives for Lubricants in the Oil Refinery of Porto, Portugal  
J. Manuel Feliz de Teixeira and António E. S. Carvalho Brito ................................341

Modelling of Porous Flow in Underground System  
Naghmeh Keshavarzi-Roonizi, Rahim Ghorashi, Vahid Nassehi and Diganta Bhusan Das .................................................................348

Architecture for Simulation and Knowledge Based Supervision for Process Facilities  
Hans-Werner Schmidt, Ulrich Saffert, Gerhard Schreck, Alexander Sabov and Matthias Pleßow ..........................................................363

Tools for knowledge Acquisition, Modeling and Visualisation Applied to Process Supervision  
Rainer Fröhling, Michael Pocher, Matthias Pleßow and Alexei Lisounkin ........358
MODELLING AND SIMULATION IN THE TEXTILE INDUSTRY

FIBRE AND POLYMER SIMULATION

Development of a Mathematical Model for the Drying of Textile Fabrics
Pradeep K. Agrawal and Li Xue .............................................................. 367

A Synergistic Approach by MRI and CFD for the Study of Microflow in Textiles
Johannes Leisen, Marco Märtin, Thomas Schipotinin, Elke Rodehüser, Karin Farber and Peter Farber .......................................................... 371

Using Neuro-fuzzy for Prediction ring spun yarn Strength from Cotton Fiber properties
A.Shams-Nateri .................................................................................. 376

A New Technique to Measure Raleigh’s Viscosity Parameters of Textile
Hatem Charfi and André Gagalowicz .................................................... 380

GA for Optimisation of Fibre Steering in Composite Laminates
Xavier Legrand, Don Kelly and Alan Crosky .......................................... 388

Electrical Properties of PANI-Dyneema conductive polymer Fibers – Fuzzy Logic Modeling
Bohwon Kim, Vladan Koncar and Claude Dufour .................................... 393

Microscopic modelling of polymers and their interactions
Peter Ahlström, Kim Bolton and Mikael Skrifvars .................................. 398

TEXTILE WEAVING SIMULATION

Computer Modeling of Electrostatic Web Formation
Yiyun Cai, Yong K. Kim and Abdel-fattah A. Seyam ............................... 405

Neural Network Modeling of Fabric Pilling Evaluation
Xin Binjie and Jinlian Hu ....................................................................... 410

TEXTILE INDUSTRY INVENTORY AND SALES MANAGEMENT SIMULATION

Development of an Inventory Management Spreadsheet Simulator for a large Apparel Company
Jeffrey A. Joines, Kristin A. Thoney, and Ben R. Martin .......................... 417
CONTENTS

Implementation of the Newsboy Method for the Sales Forecasting of the Apparel Industry
Sébastien Thomassey and Pierre Douillet ........................................................422

LATE PAPERS

The Design, Fabrication and Image Processing of a 3 DOF Passive Biped Walking Robot
Ahmad Bagheri, Amir Hajiloo, Salar Basiri and Rahman Yousefi Moghaddam .................................................................429

Knowledge Modeling and Processing for Supervision of Process Facilities
Jörg Krüger, Alexei Lisounkin, Alexander Sabov, Gerhard Schreck and Michael Pocher .................................................................435