

**Editors:**

**Professor José M<sup>o</sup> Zamanillo Sáinz de la Maza, University of Cantabria, Spain**

**Professor Pablo Luis López Espí, Universidad de Alcalá, Spain**

## **HOSTS and SPONSORS:**



University of Cantabria  
Plaza de la Ciencia s/n.  
39005 Santander, Spain



University of Alcalá  
Campus Universitario  
28805 Alcalá de Henares, Spain



# **SIMULATION, MODELLING AND OPTIMIZATION**

**Proceedings of the 8th WSEAS International Conference on  
SIMULATION, MODELLING and OPTIMIZATION  
(SMO '08)**

**Santander, Cantabria, Spain, September 23-25, 2008**

**Mathematics and Computers in Science and Engineering  
A series of Reference Books and Textbooks**

**ISBN: 978-960-474-007-9  
ISSN 1790-2769**

**Published by WSEAS Press  
[www.wseas.org](http://www.wseas.org)**



# **SIMULATION, MODELLING and OPTIMIZATION**

**Proceedings of the 8th WSEAS International Conference on  
SIMULATION, MODELLING and OPTIMIZATION  
(SMO '08)**

**Santander, Cantabria, Spain, September 23-25, 2008**

## **HOSTS and SPONSORS:**



University of Cantabria  
Plaza de la Ciencia s/n.  
39005 Santander, Spain



**Universidad  
de Alcalá**

University of Alcalá  
Campus Universitario  
28805 Alcalá de Henares, Spain

Mathematics and Computers in Science and Engineering  
A series of Reference Books and Textbooks

Published by WSEAS Press  
[www.wseas.org](http://www.wseas.org)

ISSN: 1790-2769  
ISBN: 978-960-474-007-9

# **SIMULATION, MODELLING and OPTIMIZATION**

**Proceedings of the 8th WSEAS International Conference on  
SIMULATION, MODELLING and OPTIMIZATION  
(SMO '08)**

**Santander, Cantabria, Spain, September 23-25, 2008**

## **HOSTS and SPONSORS:**



**Universidad  
de Alcalá**

University of Alcala  
Campus Universitario  
28805 Alcala de Henares,  
Spain



University of Cantabria  
Plaza de la Ciencia s/n.  
39005 Santander, Spain

Mathematics and Computers in Science and Engineering  
A series of Reference Books and Textbooks

Published by WSEAS Press

[www.wseas.org](http://www.wseas.org)

**Copyright © 2008, by WSEAS Press**

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.  
See also: <http://www.worldses.org/review/index.html>

ISSN: 1790-2769

ISBN: 978-960-474-007-9



World Scientific and Engineering Academy and Society

# **SIMULATION, MODELLING and OPTIMIZATION**

**Proceedings of the 8th WSEAS International Conference on  
SIMULATION, MODELLING and OPTIMIZATION  
(SMO '08)**

**Santander, Cantabria, Spain, September 23-25, 2008**

## **HOSTS and SPONSORS:**



University of Cantabria  
Plaza de la Ciencia s/n.  
39005 Santander, Spain



**Universidad  
de Alcalá**

University of Alcalá  
Campus Universitario  
28805 Alcalá de Henares, Spain

## **Editors:**

Professor José M<sup>a</sup> Zamanillo Sáinz de la Maza, University of Cantabria, Spain  
Professor Pablo Luis López Espí, Universidad de Alcalá, Spain

## International Program Committee Members:

Irwin W. Sandberg, USA  
Asad A. Abidi, USA  
Andreas Antoniou, USA  
Antonio Cantoni, AUSTRALIA  
Lotfi Zadeh, USA  
George Szentirmai, USA  
Michael Peter Kennedy, IRELAND  
Paresh C. Sen, CANADA  
Michel Gevers, BELGIUM  
James S. Thorp, USA  
Armen H. Zemanian, USA  
Guanrong Chen, HONG KONG  
Edgar Sanchez-Sinencio, USA  
Jim C. Bezdek, USA  
A. J. van der Schaft, the NETHERLANDS  
Istvan Nagy, Hungary  
Wasfy B. Mikhael, USA  
M. N. S. Swamy, CANADA  
M. Araki, JAPAN  
Abbas El Gamal, USA  
Franco Maloberti, Italy  
Alan N. Willson Jr., USA  
Yoji Kajitani, JAPAN  
Mohammed Ismail, USA  
Kemin Zhou, USA  
Ruey-Wen Liu, USA  
Nabil H. Farhat, USA  
John I. Sewell, UK  
Jerry M. Mendel, USA  
Magdy A. Bayoumi, USA  
Bertram E. Shi, HONG KONG  
M. Omair Ahmad, CANADA  
N. K. Bose, USA  
Igor Lemberski, LATVIA  
Alfred Fettweis, GERMANY  
Brockway McMillan, USA  
H. J. Orchard, USA  
Jacob Katzenelson, ISRAEL  
Vincent Poor, USA  
Abraham Kandel, USA  
Bor-Sen Chen, CHINA  
C. S. George Lee, USA  
Hamid R. Berenji, USA  
Kevin M. Passino, USA  
Lawrence O. Hall, USA  
Ronald R. Yager, USA  
Witold Pedrycz, CANADA  
Agoryaswami J. Paulraj, USA  
Ahmed H. Tewfik, USA  
Alan V. Oppenheim, USA  
Alfonso Farina, ITALY  
Alfred O. Hero, USA  
Ali H. Sayed, USA  
Anders Lindquist, SWEDEN  
Arthur B. Baggeroer, USA  
Arye Nehorai, USA  
Benjamin Friedlander, USA  
Bernard C. Levy, USA  
Bhaskar D. Rao, USA  
Bin Yu, USA  
Boualem Boashash, AUSTRALIA  
Brian D. O. Anderson, AUSTRALIA  
Bruce A. Francis, CANADA  
C. Richard Johnson, USA  
C. Sidney Burrus, USA  
Charles M. Rader, USA  
Desmond P. Taylor, NEW ZEALAND  
Donald L. Duttweiler, USA  
Donald W. Tufts, USA  
Douglas L. Jones, USA  
Earl E. Swartzlander, USA  
Ed F. Deprettere, the NETHERLANDS  
Edward A. Lee, USA  
Edward J. Powers, USA  
Ehud Weinstein, ISRAEL  
Eli Brookner, USA  
Ezio Biglieri, Italy  
Faye Boudreaux-Bartels, USA  
Georgios B. Giannakis, USA  
Gonzalo R. Arce, USA  
H. Vincent Poor, USA  
Hagit Messer, ISRAEL  
John V. McCanny, UK  
Joos Vandewalle, BELGIUM  
Jose C. Principe, USA  
Jose M. F. Moura, USA  
K. J. Ray Liu, USA  
Kaushik Roy, USA  
Kenneth Rose, USA  
Keshab K. Parhi, USA  
Kon Max Wong, CANADA  
Kung Yao, USA  
Louis L. Scharf, USA  
Martin Vetterli, USA  
Mati Wax, USA  
Meir Feder, ISRAEL  
Michael C. Wicks, USA  
Michael D. Zoltowski, USA  
Michael T. Orchard, USA  
Michael Unser, SWITZERLAND  
Miguel Angel Lagunas, SPAIN  
Moeness G. Amin, USA  
Mohamed Najim, FRANCE  
Neil J. Bershad, USA  
P. P. Vaidyanathan, USA  
Patrick Dewilde, NETHERLANDS  
Peter Willett, USA  
Petre Stoica, SWEDEN  
Phillip A. Regalia, FRANCE  
Pierre Duhamel, FRANCE  
Pierre Moulin, USA  
Pramod K. Varshney, USA

Rabab Kreidieh Ward, CANADA  
Robert M. Gray, USA  
Rolf Unbehauen, GERMANY  
Ronald W. Schafer, USA  
Rui J. P. Figueiredo, USA  
Russell M. Mersereau, USA  
Sadaoki Furui, JAPAN  
Shun-Ichi Amari, JAPAN  
Simon Haykin, CANADA  
Soo-Chang Pei, CHINA  
Soutra Dasgupta, USA  
Stefan L. Hahn, POLAND  
Steven Kay, USA  
Takao Hinamoto, JAPAN  
Takashi Matsumoto, JAPAN  
Tapio Saramaki, FINLAND  
Tariq S. Durrani, U.K.  
Thomas F. Quatieri, USA  
Thomas L. Marzetta, USA  
Thomas S. Huang, USA  
Thomas W. Parks, USA  
Uri Shaked, ISRAEL  
V. John Mathews, USA  
Vladimir Cuperman, USA  
William A. Pearlman, USA  
Wolfgang Fichtner, SWITZERLAND  
Wu-Sheng Lu, CANADA  
Yaakov Bar-Salom, USA  
Yingbo Hua, USA  
Yong Ching Lim, SINGAPORE  
Yoram Bresler, USA  
Zhi Ding, USA  
A. A. Goldenberg, CANADA  
Angel Rodriguez-Vasquez, SPAIN  
Erol Gelenbe, USA  
F. L. Lewis, USA  
Harry Wechsler, USA  
Howard C. Card, CANADA  
Lei Xu, P. R. CHINA  
Leon O. Chua, USA  
Marco Gori, ITALY  
Narasimhan Sundararajan, SINGAPORE  
Sankar K. Pal, India  
Tamas Roska, USA  
A. Stephen Morse, USA  
Alberto Isidori, USA  
Ali Saberi, USA  
Andrew R. Teel, USA  
Antonio Vicino, ITALY  
Anuradha M. Annaswamy, USA  
Benjamin Melamed, USA  
Bruce H. Krogh, USA  
David D. Yao, USA  
Donald Towsley, USA  
Eduardo D. Sontag, USA  
Edward J. Davison, CANADA  
G. George Yin, USA  
Giorgio Picci, ITALY  
Graham C. Goodwin, AUSTRALIA  
Han-Fu Chen, CHINA  
Harold J. Kushner, USA  
Hidenori Kimura, JAPAN  
Ian Postlethwaite, UK  
Ian R. Petersen, AUSTRALIA  
Jan C. Willems, NETHERLANDS  
Jim S. Freudenberg, USA  
Karl Johan Astrom, SWEDEN  
Lennart Ljung, SWEDEN  
M. Vidyasagar, INDIA  
Mark W. Spong, USA  
Matthew R. James, AUSTRALIA  
Munther A. Dahleh, USA  
P .R. Kumar, USA  
Peter E. Caines, CANADA  
Pramod P. Khargonekar, USA  
Richard T. Middleton, AUSTRALIA  
Roberto Tempo, Italy  
Roger W. Brockett, USA  
Romeo Ortega, FRANCE  
Shankar Sastry, USA  
Stephane Lafortune, USA  
Steven I. Marcus, USA  
T. E. Duncan, USA  
Tamer Basar, USA  
W. M. Wonham, CANADA  
Weibo Gong, USA  
Xi-Ren Cao, Hong Kong  
Yu-Chi Ho, United Kingdom  
Maricel Adam, ROMANIA  
Mohd. Hasan, Ali KOREA  
Fuad Alkoot, KUWAIT  
Atef Al-Najjar, SAUDI ARABIA  
Horia Andrei, ROMANIA  
Alexandre Rasi, Aoki BRAZIL  
Francisco Aparisi, SPAIN  
Junichi Arai, JAPAN  
Enrique Arce-Medina, MEXICO  
Bhed Bahadur, Bista JAPAN  
Razvan Bologa, ROMANIA  
Chung Chang, TAIWAN  
Tianzhou Chen, CHINA  
Ting-yu Chen, TAIWAN  
Ali Dastfan, IRAN  
Darie Eleonora, ROMANIA  
Huaiguo Fu, IRELAND  
Hiroyuki Goto, JAPAN  
Jyh-cherng Gu, TAIWAN  
Jihong Han, CHINA  
Athanasios Hatzigaidas, GREECE  
Aghileh Heidari, IRAN  
Jung-wen Hsia, TAIWAN  
Yu-Jung Huang, TAIWAN  
Supachate Innet, THAILAND  
Dimitris Iraclous, GREECE

Shabiul Islam, MALAYSIA  
Gangyi Jiang, CHINA  
Ahad Kazemi, IRAN  
Cheong Kim, KOREA  
Thanatchai Kulworawanichpong, THAILAND  
Suwat Kuntanapreeda, THAILAND  
Marek Kurzynski, POLAND  
Yangwon Kwon, KOREA  
Heungjae Lee, KOREA  
Tsang-Hsiung Lee, TAIWAN  
Xiaolu Li, CHINA  
Hengwuli Li, CHINA  
Robert Lis, POLAND  
Hongzhe Liu, CHINA  
Jia-Jiunn Lo, TAIWAN  
Ana-Ramona Lupu, ROMANIA  
Ramezanali Mahdavinejad, IRAN  
Nashat Mansour, LEBANON  
Boonruang Marungsri, THAILAND  
Nikos Mastorakis, GREECE  
Tetsushi Miki, JAPAN  
Mohammad reza Mollahoseini, IRAN  
Dan El Montoya, VENEZUELA  
Francesco Moschella, ITALY  
Francesco Muzi, ITALY  
Fumio Nishiyama, JAPAN  
Anant Oonsivilai, THAILAND  
Andrey Osipov, RUSSIA  
Padej Pao-la-or, THAILAND  
Suraj Pardeshi, INDIA  
Sanda Victorinne Paturca, ROMANIA  
Carlos Pedreira, BRAZIL  
Edward Puchala, POLAND  
Pallikonda Ravi Babu, INDIA  
Carolina Regoli, VENEZUELA

Chen Rong-Chang, TAIWAN  
Ahmet Sezer, TURKEY  
Shiva Shavandi, IRAN  
Miguel Strefezza, VENEZUELA  
Sueo Sugimoto, JAPAN  
Supaporn Suwannarongsri, THAILAND  
Kiyoharu Tagawa, JAPAN  
Tsuyoshi Takayama, JAPAN  
Sun-Yen Tan, TAIWAN  
Shu bin Tan, CHINA  
Sejid Teynjak, CROATIA (HRVATSKA)  
Michael Theodoridis, GREECE  
Dat Tran, AUSTRALIA  
Sirirut Vanichayobon, THAILAND  
Xun Wang, CHINA  
En-Rong Wang, CHINA  
Ning Wang, CHINA  
Shugang Wei, JAPAN  
Riyu Wei, AUSTRALIA  
Wiphada Wettayaprasit, THAILAND  
Khoi Loon Wong, AUSTRALIA  
Chi-Jui Wu, TAIWAN  
Fuli Wu, CHINA  
Peng Wu, CHINA  
Li Xiao, CHINA  
Weiwei Xing, CHINA  
Zhiguang Xu, UNITED STATES  
Likang Yang, SWEDEN  
Liu Yongqi, CHINA  
Haslinda Zabiri, MALAYSIA  
Mohamed Zahran, EGYPT  
Chao Zhang, CANADA  
Xingping Zhang, CHINA  
Yanlei Zhao, CHINA  
Jin Zhu, KOREA

## **Preface**

This book contains the proceedings of the 8th WSEAS International Conference on SIMULATION, MODELLING and OPTIMIZATION (SMO '08) which was held in Santander, Cantabria, Spain, September 23-25, 2008. This conference aims to disseminate the latest research and applications in Simulation via Computational Linear Algebra techniques, Numerical Behaviour of Optimization Algorithms, The Art of Computer Programming of Numerical Methods, Signal Processing and other relevant topics and applications.

The friendliness and openness of the WSEAS conferences, adds to their ability to grow by constantly attracting young researchers. The WSEAS Conferences attract a large number of well-established and leading researchers in various areas of Science and Engineering as you can see from <http://www.wseas.org/reports>. Your feedback encourages the society to go ahead as you can see in <http://www.worldses.org/feedback.htm>

The contents of this Book are also published in the CD-ROM Proceedings of the Conference. Both will be sent to the WSEAS collaborating indices after the conference: [www.worldses.org/indexes](http://www.worldses.org/indexes)

In addition, papers of this book are permanently available to all the scientific community via the WSEAS E-Library.

Expanded and enhanced versions of papers published in this conference proceedings are also going to be considered for possible publication in one of the WSEAS journals that participate in the major International Scientific Indices (Elsevier, Scopus, EI, ACM, Compendex, INSPEC, CSA .... see: [www.worldses.org/indexes](http://www.worldses.org/indexes)) these papers must be of high-quality (break-through work) and a new round of a very strict review will follow. (No additional fee will be required for the publication of the extended version in a journal). WSEAS has also collaboration with several other international publishers and all these excellent papers of this volume could be further improved, could be extended and could be enhanced for possible additional evaluation in one of the editions of these international publishers.

Finally, we cordially thank all the people of WSEAS for their efforts to maintain the high scientific level of conferences, proceedings and journals.

## Table of Contents

<b>Plenary Lecture I: Fuzzy Control of Electrical Drives</b> <i>Constantin Volosencu</i>	15
<b>Plenary Lecture II: Artificial Social Systems for Workflow Chart</b> <i>Calin I. Ciufudean</i>	16
<b>Plenary Lecture III: Opposition-Based Computation</b> <i>Shahryar Rahnamayan</i>	17
<b>Plenary Lecture IV: Classification Methods for Bibliomining</b> <i>Ioana Moisil</i>	18
<b>Plenary Lecture V: Modeling Pedestrian Dynamics in Evacuation Processes</b> <i>Robert A. Kosinski</i>	20
<b>Plenary Lecture VI: Change Point in Time Series Data</b> <i>Azami Zaharim</i>	22
<b>Plenary Lecture VII: System Dynamics Models for Business Process Optimization: An Application to Supply Chain Management</b> <i>Roberto Revetria</i>	23
<b>Special Session I: High Frequency Circuits and Systems</b> <i>José María Zamanillo Sainz de la Maza and Pablo Luis López Espí</i>	25
<b>Using Hydro Mathematical Model in Simulating Dynamic Behaviour of Hydromechanical Equipment of Hydro Power Plant Raul Mare-Retezat, Romania</b> <i>Flavius Dan Surianu and Constantin Barbulescu</i>	27
<b>Observability of 4th Order Dynamical Systems</b> <i>Jerzy Stefan Respondek</i>	33
<b>Project Scheduling using a Competitive Genetic Algorithm</b> <i>J. Magalhães-Mendes</i>	39
<b>Dynamics of Fine Mechanical Embarked Systems in Channel of (Rhs0) Launcher</b> <i>Constantin Enache, Eugen Trană and Tudor Cherecheş</i>	43
<b>Comparative Study of the Best Estimators in a New Modeling Technique Using Wireless Sensor Networks</b> <i>Mehrdad Babazadeh, Reiner Jedermann and Walter Lang</i>	47
<b>Furniture Production Optimization with Visual Simulation and Genetic Algorithms</b> <i>Davorin Kofjač and Miroљjub Kljajić</i>	53

<b>A Balanced Scheduler for Grid Computing</b>	<b>59</b>
<i>A.J. Sánchez Santiago, A.J. Yuste, J.E. Muñoz Expósito, S. García Galán and S. Bruque</i>	
<b>GPS in Topographic Applications</b>	<b>65</b>
<i>Gabriel De Jesus Oseguera-Cruz, Mario Reyes-Ayala, Edgar Alejandro Andrade-Gonzalez and Jose Alfredo Tirado-Mendez</i>	
<b>Comparison between the MHFEM Formulation and a 2nd Spatial Order FV Formulation of the Linear Groundwater Flow Problem</b>	<b>70</b>
<i>Costanza Arico and Tullio Tucciarelli</i>	
<b>Complex Sensorial Systems Used for the Planning of Some Intelligent Vehicles Needed for the Transport of the Persons with Handicaps</b>	<b>78</b>
<i>Valeriu Lupu, Catalin Lupu and Nicolae Morariu</i>	
<b>Study of the Working Regime of the Bucket Wheel Excavators in the Conditions of Romanian Open Pit Lignite Mines</b>	<b>83</b>
<i>Marin Silviu Nan, Iosif Kovacs, Iosif Andras and Dumitru Jula</i>	
<b>The Mechanized Face as a System</b>	<b>89</b>
<i>Sorin Mihai Radu</i>	
<b>Research Regarding the Improvement of the Methodology and Means Used for the Balancing by Weighting of Bucket Wheel Excavators</b>	<b>94</b>
<i>Marin Silviu Nan, Iosif Kovacs and Florin Dumitru Popescu</i>	
<b>Lateral Control for an Aircraft of Folding Wing</b>	<b>99</b>
<i>Zheng Jiewang1, Wei Li and Shijun Guo</i>	
<b>Investigating in Scalability of Opposition-Based Differential Evolution</b>	<b>105</b>
<i>Shahryar Rahnamayan and G. Gary Wang</i>	
<b>Interactive Diagnosis of Flexible Manufacturing Systems</b>	<b>112</b>
<i>Calin Ciufudean, Constantin Filote and Dumitru Amarandei</i>	
<b>Automatic Control System for Heating Systems in Buildings Based on Measuring the Heat Exchange through Outer Surfaces</b>	<b>117</b>
<i>Daniel Popescu and Calin Ciufudean</i>	
<b>Monte Carlo Modelling and Simulation of Cell Exocytosis</b>	<b>122</b>
<i>Amparo Gil, Virginia Gonzalez-Velez and Javier Segura</i>	
<b>Stabilization of the Fuzzy Control Systems, with Application at the Second Order Systems</b>	<b>127</b>
<i>Constantin Volosencu</i>	
<b>Modeling, Simulation and Optimal Control of the Natural Gas Jibissa Plant</b>	<b>133</b>
<i>Cristian Patrascioiu, Mihaela Petre and Issa Rabahi</i>	

<b>Vehicular Monitoring for Arbitrary Routes in the City</b>	<b>138</b>
<i>Emmanuel Gomez-Nuñez, Miguel Angel Garcia-Gomez, Mario Reyes-Ayala, Edgar Alejandro Andrade-Gonzalez and Jose Alfredo Tirado-Mendez</i>	
<b>An Adaptive Lighting System Using the Simulated Annealing Algorithm</b>	<b>142</b>
<i>Ovidiu Grigore, Inge Gavtat, Corina Grigore and Marius Cotescu</i>	
<b>Study of Using Shift Registers in Cryptosystems for Grade 8 Irreducible Polynomials</b>	<b>148</b>
<i>Mirella Amelia Mioc</i>	
<b>Fatigue Life Assessment of a Shell Structure from Different Steel Types: A Case Study Using Variable Amplitude Loadings</b>	<b>153</b>
<i>S. Abdullah, S. M. Beden, A. K. Ariffin, Z. M. Nopiah, A. Zaharim and M. M. Rahman</i>	
<b>Application of the Nelder-Mead Optimization in Ray-Tracing in the Determination of Satellite Location</b>	<b>160</b>
<i>Siti Sarah NIK Zulkifli, Mardina Abdullah, Azami Zaharim and Mahamod Ismail</i>	
<b>A Model for a Complex Polynomial SVM Kernel</b>	<b>164</b>
<i>Dana Simian</i>	
<b>The Implementation of Clean Production</b>	<b>170</b>
<i>Valeriu Lupu, Catalin Lupu and Nicolae Morariu</i>	
<b>Heat Transfer Correlation for the V-Groove Solar Collector</b>	<b>177</b>
<i>A.Fudholi, K. Sopian, M.Y. Othman, M.H. Ruslan, M.A. AlGhoul, A. Zaharim and R. Zulkifly</i>	
<b>Membrane and Bipolar Plates Materials for Regenerative Fuel Cells</b>	<b>183</b>
<i>Salwan S.Dihrab, K. Sopian and A. Zaharim</i>	
<b>A Thermal Comfort Levels Investigation of a Naturally Ventilated and Air-Conditioned Office</b>	<b>189</b>
<i>R. Daghigh, N.M. Adam, K.Sopian, A. Zaharim and B.B. Sahari</i>	
<b>Application of Business Subsystem for Production Monitoring</b>	<b>195</b>
<i>Ivan Grbavac, Vedran Batos and Kresimir Fertalj</i>	
<b>Modelling Time in Protensional Agents</b>	<b>200</b>
<i>Alexandru V. Georgescu and Boldur E. Barbat</i>	
<b>Practical Aspects Regarding Network Monitoring</b>	<b>204</b>
<i>Corina Simian and Vladislav Georgiev</i>	
<b>Optimization Techniques for Tuning Heading Controllers of an Autonomous Inscale Fast-ferry Model</b>	<b>208</b>
<i>Francisco J. Velasco, Elías Revestido, Eloy Lopez, Emiliano Moyano and M. Haro Casado</i>	

<b>An Application of Neural Network Solution in the Apparel Industry for Cutting Time Forecasting</b> <i>Yelda Ozel and Mahmut Kayar</i>	<b>214</b>
<b>Using Neural Network Method to Solve Marker Making “Calculation of Fabric Lays Quantities” Efficiency for Optimum Result in the Apparel Industry</b> <i>Mahmut Kayar and Yelda Ozel</i>	<b>219</b>
<b>Sharing of Input-Output Devices using Bluetooth</b> <i>Carlos Jonathan Ferreira-Rodríguez, Mario Reyes-Ayala, Edgar Alejandro Andrade González and José Alfredo Tirado Méndez</i>	<b>224</b>
<b>Modeling the Dynamics of Voltage-Controlled Oscillators by Combining Modified Volterra Series with an Envelope Transient Formulation</b> <i>Jacobo Domínguez, Sergio Sancho and Almudena Suárez</i>	<b>227</b>
<b>Theoretical and Experimental Research Regarding the Determination of Non-Homogeneous Materials Mechanical Cutting Characteristics</b> <i>Iosif Kovacs, Iosif Andras, Marin Silviu Nan and Florin Dumitru Popescu</i>	<b>232</b>
<b>Effect of building the Peja III -400/110 kV Station on Electro energetic System of Kosova</b> <i>Rexhep Shaqiri and Vezir Rexhepi</i>	<b>236</b>
<b>A Model for an Effective Technology Transfer to Iranian Automotive Industry</b> <i>M. Samiei Nasr</i>	<b>242</b>
<b>On New Design of Kalman Filter with Entry-wise Updating</b> <i>Evgenia Suzdaleva</i>	<b>246</b>
<b>Effective Modelling of Know-How for Cyber-Informatics Practitioners</b> <i>Jiri F. Urbanek</i>	<b>252</b>
<b>Application Modelling &amp; Simulation of Data Flow in Disaster Events Management</b> <i>Jiri F. Urbanek</i>	<b>256</b>
<b>A Novel Fast Kolmogorov's Spline Complex Network for Pattern Detection</b> <i>Hazem M. El-Bakry and Nikos Mastorakis</i>	<b>261</b>
<b>Simulation Study of A Lightweight TDMA Based MAC Protocol with Adaptive Power Control for Wireless Sensor Network</b> <i>Rozeha Abd Rashid, Wan Mohd Ariff Ehsan W Embong, Norsheila Fisal and Azami Zaharim</i>	<b>280</b>
<b>SPECIAL SESSION I: High Frequency Circuits and Systems</b>	<b>287</b>
<b>RF and Microwave Mixer Behavioural Modelling</b> <i>F. J. Casas, N. Garmendia and J. Portilla</i>	<b>289</b>

<b>Equivalent Circuit of an Aperture Coupled Patch Antenna for Beam Control Applications</b>	<b>298</b>
<i>Naima Amar Touhami, Lorena Cabria de Juan, José Ángel García García, Constantino Pérez Vega, Antonio Tazón Puente and Mohamed Boussouis</i>	
<b>Using a OMNET++ network based simulator as test-bed for network design algorithms</b>	<b>303</b>
<i>Javier Diaz-Estebarez, J. Antonio Portilla-Figueras, Sancho Salcedosanz, Miguel Faro-Rivas and Guillermo Esteve-Asensio</i>	
<b>Overview of Power Amplifier Linearization Based on Predistorsion Techniques</b>	<b>309</b>
<i>E. Bertran, P.L. Gilabert, G. Montoro and J. Berenguer</i>	
<b>Modelling Reliability in GaN HEMT Devices</b>	<b>315</b>
<i>T. Fernández, F. Sánchez, M. Verdú, A. Tazón, A. Mimouni, J.A. Garcia and A. Mediavilla</i>	
<b>Practical Approach to the Near and Far Field Regions</b>	<b>319</b>
<i>C. Pérez-Vega, J. M. Zamanillo and A. Mediavilla</i>	
<b>Microwave Active Devices Modeling Using Verilog-A Description Language</b>	<b>322</b>
<i>J.M. Zamanillo, P. L. López-Espí, Sergio Rivera, Beatriz Cobo, Raquel Torres, Angel Mediavilla and C. Pérez-Vega</i>	
<b>Microwave Large-Signal PHEMT Model for SPICE-based Simulators</b>	<b>327</b>
<i>J. M. Zamanillo, H. Ingelmo, B. Cobo, C. Perez-Vega and A. Mediavilla</i>	
<b>CW LASER Control of MMICs</b>	<b>332</b>
<i>J. M. Zamanillo, J. Portilla, B. Cobo, C. Navarro and C. Pérez-Vega</i>	
<b>Path-Loss Model for UHF Bands IV and V</b>	<b>337</b>
<i>J. M. Zamanillo, C. Pérez-Vega and B. Cobo</i>	
<b>Robust Method to Extract Electrical Microwave Packages Models</b>	<b>340</b>
<i>C. Pérez-Vega, J. M. Zamanillo, A. Mediavilla and B. Cobo</i>	
<b>Wideband Noise Envelope-Transient Simulation in Radiometers Operating with Multiple Time-scales</b>	<b>346</b>
<i>J. P. Pascual, F. J. Casas, M. L. De La Fuente, B. Aja and E. Artal</i>	
<b>The Role of Correct Measurements in the Modeling of Microwave Active Devices</b>	<b>351</b>
<i>J. M. Zamanillo, A. Mediavilla AND C. Pérez-Vega</i>	
<b>Measurement and Model of Non-Ionizing Radiation Levels in an Urban Environment</b>	<b>354</b>
<i>C. Pérez-Vega, J. M. Zamanillo AND L.F. Herran</i>	
<b>Large-signal Model of AlGaAs P-HEMT under Optical Illumination</b>	<b>359</b>
<i>J. M. Zamanillo, A. Mediavilla, C. Pérez-Vega AND A. Tazón</i>	
<b>Theoretical Results on the Power Efficiency Versus Spectral Efficiency Compromise of Wireless Transmitters</b>	<b>363</b>
<i>José Carlos Pedro</i>	

<b>Electromagnetic Analysis of Band-Pass Filters Using Half Wavelength Hollow Resonators</b>	<b>367</b>
<i>Pablo L. Lopez, Jose M. Zamanillo, Rocio Sanchez, Jose F. Pasamon, Francisco Calvo and Carlos Perez</i>	
<b>Class E and Class D<sup>-1</sup> GaN HEMT Switched-Mode Power Amplifiers</b>	<b>370</b>
<i>J. A. García, R. Merlín, M. Fernández, B. Bedia, L. Cabria, R. Marante and T. M. Martín-Guerrero</i>	
<b>A User-Friendly CAD Tool for the Rigorous and Efficient Analysis of Planar Waveguiding Structures for Millimetre Applications</b>	<b>375</b>
<i>Alicia Casanueva, Oscar Gonzalez, Ana Grande, Naima Amar Touhami and Isabel Zamanillo</i>	
<b>4th WSEAS International Symposium on DATA MINING and INTELLIGENT INFORMATION PROCESSING</b>	<b>381</b>
<b>Quantifying the Proportion of Damaged Sperm Cells Based on Image Analysis and Neural Networks</b>	<b>383</b>
<i>R. Alaiz-Rodriguez, E. Alegre-Gutierrez, V. Gonzalez-Castro and L. Sanchez</i>	
<b>On the Use of Surrounding Neighbors for Synthetic Over-Sampling of the Minority Class</b>	<b>389</b>
<i>V. García, J. S. Sánchez and R. A. Mollineda</i>	
<b>Rule Generation to Determine the Gender of a Speaker of a Japanese Sentence</b>	<b>395</b>
<i>Kanako Komiya, Koji Fujimoto, Yashuhiro Tajima and Yoshiyuki Kotani</i>	
<b>Error Analysis in Artificial Neural Networks: the Imbalanced Distribution Case</b>	<b>401</b>
<i>R. Alejo, J.M. Sotoca and M. G. De La Rosa</i>	
<b>Opinion Mining in Hungarian Based on Textual and Graphical Clues</b>	<b>408</b>
<i>Gábor Berend and Richárd Farkas</i>	
<b>Author Index</b>	<b>415</b>

## Plenary Lecture I

### Fuzzy Control of Electrical Drives



**Professor Constantin Volosencu**

Department of Automatics and Applied Informatics  
"Politehnica" University of Timisoara  
Bd. V. Parvan nr. 2, Timisoara 300223  
ROMANIA  
E-mail: [constantin.volosencu@aut.upt.ro](mailto:constantin.volosencu@aut.upt.ro)

**Abstract:** The paper presents a short survey of some topics related to speed control of electrical drives based on fuzzy PI controllers. In the beginning the conventional control systems of the main three motors mostly used in practice: DC motors, induction motors and permanent magnet synchronous motors are taken in discussion, emphasizing the way of their PI liner controller design. The paper presents how the fuzzy PI speed controllers may be developed for all three motors. A stability analysis of the fuzzy control of DC control system, based on circle criterion is presented. Modeling and simulation Simulink diagrams with transient characteristics for different functioning regimes are presented. A comparison of the quality criteria for fuzzy control systems and linear control systems is discussed. Some ways of implementation of the fuzzy speed controllers based on interpolation and neural networks is presented.

**Brief Biography of the Speaker:** Prof. Constantin Volosencu graduated in 1981 the Faculty of Electrotechnics, "Traian Vuia" Polytechnic Institute of Timisoara, Romania, as an engineer in automatics and computers and he is doctor in control systems from 2000 at "Politehnica" University of Timisoara. In present he is professor at "Politehnica" University of Timisoara, Faculty of Automatics and Computers, Department of Automatics and Applied Informatics. His interest is in linear control systems, fuzzy control, neural networks, control of electrical drives, modeling, simulation, identification and sensor networks. He is author of 9 books, of more then 100 published papers, he was manager of 30 national an international research projects. Constantin Volosencu worked from 1981 to 1990 at "Electrotimis" Enterprise Timisoara, in the field of control systems for industrial machines, where he developed control equipments for a large scale of machineries, which are the objects of 27 patents.

## Plenary Lecture II

### Artificial Social Systems for Workflow Chart



**Associate Professor Calin I. Ciufudean**  
Department of Automatics and Computers  
Faculty of Electrical Engineering and Computer Science  
“Stefan Cel Mare” University of Suceava  
9, University str., RO720225, Suceava  
ROMANIA  
E-mail: [calin@eed.usv.ro](mailto:calin@eed.usv.ro)

**Abstract:** We focus on the control of the performance characteristics of workflows modelled with stochastic Petri nets (SPN's). This goal is achieved using a new model for Artificial Social Systems (ASS's) behaviours, and by introducing equivalent transfer functions for SPN's.

ASS's exist in practically every multi-agent system, and play a major role in the performance and effectiveness chart of the agents. This is the reason why we introduce a suggestive model for ASS's. To model complex systems, such as flexible manufacturing ones, a class of Petri nets is adopted, and briefly introduced.

This class allows representing the flow of physical resources and control information data of the ASS's components. In the analysis of SPN we use simulations in respect to timing parameters in a generalized semi-Markov process (GSMP). By using existing results on perturbation analysis (e.g., delays in supply with raw materials, equipment failure, etc.), and by extending them to new physical interpretations we address unbiased sensitivity estimators correlated with practical solutions in order to attenuate the perturbations.

The novelty of the approach is that the construction of large Markov chains is not required. Using a structural decomposition, the construction system is divided into cells. We can simplify the structure of the SPN using the presented approach, which is useful when we deal with complex Petri nets, and we need to simplify these structures (e.g. graphs) in order to analyze them properly. For each cell a Markov model was derived and the probability was determined of at least  $N_i$  working machines in cell  $i$ , for  $i = 1, 2, \dots, n$  and  $j$ , where  $j=1, \dots, m$ , working material handling system (MHS) at time  $t$ , where  $N_i$  and  $j$  satisfy the system production capacity requirements. An example illustrates this approach. The results reported here form the basis of several enhancements, such as conducting performance studies of complex systems with multiple part types.

#### Brief Biography of the Speaker:

- Honor Member of the Romanian Society of Electrical & Control Engineering - Member of the Romanian Technical Experts Corp.
- Technical Expert of the Romanian Ministry of Justice.
- President of the Romanian Society of Electrical & Control Engineering, Suceava Branch.
- Academic Positions: Assoc. Professor, Dept. of Automatics and Computers, Faculty of Electrical Engineering and Computer Science, “Stefan cel Mare” University of Suceava, Romania.
- Fields of Scientific Activities: Discrete Event Systems, Complex Measurement Systems, Reliability and Diagnosis of Control Systems, Environmental Management.
- He published 6 books and over 120 scientific papers in conference proceedings and journals

## Plenary Lecture III

### Opposition-Based Computation



**Assistant Prof. Shahryar Rahnamayan**

University of Ontario Institute of Technology (UOIT)  
Electrical and Computer Engineering  
Oshawa, ON,  
CANADA

Email: [Shahryar.Rahnamayan@uoit.ca](mailto:Shahryar.Rahnamayan@uoit.ca)

Website: <http://www.eng.uwaterloo.ca/~s2rahnam/>

**Abstract:** Footprints of the opposition concept can be observed in many areas around us. But it has sometimes been known by different names. Opposite particles in physics, complement of an event in probability, absolute or relative complement in set theory, and theses and antitheses in dialectic just are some examples to mention. But for the first time, recently, Opposition-Based Learning (OBL) was proposed and then the opposition-based approaches have been introduced in different artificial intelligence areas. All of them have tried to enhance searching or learning process by utilizing the opposition concept. Opposition-based evolutionary algorithms, opposition-based neural networks, and also opposition-based reinforcement learning are some efforts in this direction. The main idea behind OBL is the simultaneous consideration of a candidate and its corresponding opposite candidate in order to achieve a better approximation for the current solution. This lecture will introduce Opposition-Based Computation (OBC) in general and also its possible variant applications in soft computing techniques.

**Brief Biography of the Speaker:** Dr. Shahryar Rahnamayan received his B.Sc. and M.S. degrees both with honors in software engineering from Shahid Beheshti University, Iran. In 2007, he received his Ph.D. degree in the field of evolutionary computation from University of Waterloo (UW), Canada. The opposition-based differential evolution (ODE) was proposed in his PhD thesis. Since August 2007, he has been a chief research manager at OMISA Inc. (Omni-Modality Intelligent Segmentation Assistant); a company which develops innovative software for medical image segmentation. Before joining to faculty of engineering and applied science, University of Ontario Institute of Technology (UOIT), Canada, as a faculty member, he was a postdoctoral fellow at Simon Fraser University (SFU), Canada. His research includes evolutionary algorithms, image processing, and opposition-based computation. Dr. Shahryar was awarded the Ontario Graduate Scholarship (OGS), President's Graduate Scholarship (PGS), NSERC's Japan Society for the Promotion of Science (JSPS) Fellowship, NSERC's Industrial R&D Fellowship (IRDF), NSERC's Visiting Fellowship in Canadian Government Laboratories (VF), and the Canadian Institute of Health Research (CIHR) Fellowship for two times.

## Plenary Lecture IV

### Classification Methods for Bibliomining



**Professor Ioana Moisil**

Department of Computer Science and Automatic Control,  
Hermann Oberth Faculty of Engineering  
Lucian Blaga University of Sibiu  
Blvd. Victoriei 10  
550024 Sibiu  
ROMANIA

Email: [ioana.moisil@ulbsibiu.ro](mailto:ioana.moisil@ulbsibiu.ro)

Website: <http://csac.ulbsibiu.ro>

**Abstract:** Advances in information technology are having an important impact on library systems. Large collections of heterogeneous data, from ancient manuscripts to sounds, videos and spatial data are now available in electronic format. Digital libraries are capturing human knowledge and distributing it over the web. The increasing volume of data in today digital repositories and library data warehouses has determined a wide use of computer-based sophisticated analysis techniques. Special operation of data mining can be performed in order to answer questions of librarians and researchers in information science. In 2003, S. Nicholson and J. Stanton introduced a new term – bibliomining - for data mining library systems. Therefore bibliomining is a large umbrella incorporating all data mining methods based on mathematics, statistics, operational research, machine learning, evolutionary computing, visualization techniques, and including traditional methods of analysing groups of bibliographic references as authorship, publications, and literature, specific to bibliometrics. Librarians and researchers in information science are mining library data warehouses and other library data collections in order to discover patterns and to understand library users' behaviour, their information and services needs, but also in order to evaluate and predict the effectiveness of library services, to discover trends in queries and to identify hot topics. Classification of items based on their characteristics (features, attributes, properties) in pre-defined categories is one of the most important bibliomining tasks. Classification is defined as the ordering of items in pre-defined groups (categories) or classes, based on their similarity. The classification process consists in assigning one of  $k$  labels (or classes) to each of  $n$  items derived from a specific problem. Classification predicts categorical labels. Analysis goal is to find a classification, a model or profile for each class that optimizes a combinatorial function consisting of assignment costs, based on the individual choice of label made for each item, and separation costs - based on the pair of choices made for two related items. In machine learning classification is defined as supervised learning. Classification, as a bibliomining technique, can be used for finding hidden patterns in data by deciding to what pre-defined class to assign a record of the data set, and also in prediction, to predict group membership for data instances. This lecture describes the most important classification methods (traditional approaches as classification trees, discriminant analysis, generalized linear models, modern statistical machine learning algorithms, support vector machine, belief networks, Gaussian processes, neural network, evolutionary algorithms, swarm intelligence, boosting and ensemble) and their use in mining library data collections. Research questions regarding pre-processing operations, attribute relevance and classifiers' performance will also be discussed with emphasis on the specificity of the library items to be classified.

**Brief Biography of the Speaker:** Ioana Moisil received the M.Sc. in Mathematics at the University of Bucharest, in 1971, the scientific grade in Statistical, Epidemiological and Operation Research Methods Applied in Public Health and Medicine at the Universite Libre de Bruxelles, in Belgium, in 1991 and the Ph.D. in Mathematics at the Romanian Academy in 1997. Work places: the National Institute for Research & Development in Informatics - I.C.I

(1971-1986), Carol Davila Faculty of Medicine Bucharest – department of Biophysics, CCSSDM Center of the Ministry of Health. At present she is a full-time Professor and a Senior Researcher at the Department of Computer Science and Automatic Control – Faculty of Engineering at the “Lucian Blaga” University of Sibiu. She is the author/co-author of fourteen books and over 150 scientific papers. Her scientific interests include intelligent systems, healthcare telematics, web technologies, data-mining, e-learning, modelling and simulation, uncertainty management, human-computer interaction. Professor Moisil participated in several EU funded projects as project manager for the national partner (Telenurse ID ENTITY, MGT, PROPRACTITION, PRO-ACCESS), in Tempus projects and in national funded projects as research manager and software development coordinator (INFOSOC – eUNIV, AMTRANS – eCASTOR, INFOSOC - e-Scribe, INFOSOC – DANTE, e-EDU-Quality, eTransMobility, CNCSIS 2007-code 33, Studies on multivariate interpolation, polynomial classifiers and applications, CNCSIS 2007 – cod 1502, Aspects concerning the psycho-cognitive abilities of artificial intelligent agents and applications in ITC based education). Ioana Moisil is a member of EARLI (European Association for Research in Learning and Instruction), she is Romanian representative in the IMIA SIG and EFMI WG5 Nursing Informatics, honorary member of the Bohemian Medical Association J.E.Purkyne of Bio-engineering and Medical Informatics, member of the ISCB – International Society for Clinical Biostatistics – Romanian National Group, of the Romanian Association of Engineers, member of the IITM- International Institute of Tele-Medicine and of the Romanian Society of Mathematics Sciences. She is vice-president of the Romanian Medical Informatics Society; vice-president of the HIT Foundation for Health Informatics and Telematics and a member of RoCHI-ACM. Professor Moisil is taking part in several international peer-review committees and conferences scientific boards.

## Plenary Lecture V

### Modeling Pedestrian Dynamics in Evacuation Processes



**Professor Robert A. Kosinski**  
Head of the Physics of Complex Systems Division,  
Faculty of Physics,  
Warsaw University of Technology,  
Koszykowa 75, 00-662 Warszawa,  
POLAND

and

Central Institute for Labour Protection  
- National Research Institute,  
Czerniakowska 16, 00-701 Warszawa  
POLAND

Email: [rokos@ciop.pl](mailto:rokos@ciop.pl)

**Abstract:** In the paper the mathematical model of the evacuation processes from a chosen types of rooms in buildings, based on the Langevin equations, is presented. This process is an example of a collective dynamics of a set of self driven particles. In the equations additional term - social force - describing the interactions of the pedestrian with obstacles and other pedestrians, is included. As a result of numerical simulations the trajectories of each pedestrian in the room are found and the time of evacuation is calculated as a function of the desired velocity of pedestrians, which can be treated as the measure of the level of panic. Evacuation process can have laminar or turbulent character, depending on the geometry of the room and the number of persons present in it.

#### **Brief Biography of the Speaker:**

Prof. Robert Kosinski obtained a title of professor of physics in 1999.

He works at:

- The Faculty of Physics, Warsaw University of Technology (since 1972), where he is a Head of the Physics of Complex Systems Division
- The Central Institute for Labor Protection – National Research Institute (since 1995), in Safety Engineering Department

He performed scientific investigations in some foreign universities:

- 1982 – 1985 Wuppertal University, Germany, (Humboldt scholarship)
- 1990 Institute of Theoretical Physics, Zurich University of Technology (Switzerland)
- 1992 Centre of Nonlinear Studies, University of Johannesburg (Rep. Of South Africa)

His scientific activity concerns:

- theory of magnetism,
- investigations of nonlinear dynamical systems
- theory of artificial neural network,
- application of neural network in safety engineering,
- physics of complex systems, in particular mathematical modeling and numerical simulations of complex systems of different kind.

He is an author of

- 70 publications in the most known physical journals (as Physical Review, International Journal of Modern Physics)
- the book on Artificial Neural Network
- the academic textbook on Statistical Physics and Quantum Mechanics

He is a member of a number of scientific societies (e.g. Polish Physical Society, Societas Humboldtiana Polonorum)

## Plenary Lecture VI

### Change Point in Time Series Data



**Professor Azami Zaharim**

Coordinator for the Unit Fundamental Engineering Studies  
Faculty of Engineering and Built Environment,  
Universiti Kebangsaan Malaysia,  
43600 UKM, Bangi, Selangor  
MALAYSIA

Email: [azami@eng.ukm.my](mailto:azami@eng.ukm.my)

**Abstract:** In building a statistical model for time series data the primary concern is to know whether all the observations can be represented by one particular model or whether the parameters in the model change at some known or unknown time point, called the change point. Subsequently, change points are defined as the points in data where two adjacent segments of the time series are connected. However, there are real-world applications in which only the position of the change is required and not the fitting functions. A change point can occur as a change in mean; change in variance or covariance or both; change in parameter; change in the structural model; or change in the trend in the model at certain known or unknown time point. Time series change point can be classified into two main categories; those which infer in a change when the statistics exceed a control limit; and those which directly estimate the time of change. In each category, the time point is a main factor, where the construction of the statistics and estimation are based on whether the time of occurrence is not known or not. Practically in most cases the time of change is unknown. From the simulation, it can be conclude that the larger the difference of the parameter estimates before and after the given change point, the higher will be the probability of the detection of the change point, the models that do not include a regular differencing operator, tends to be slightly higher in the probability of detection than the others, similar results occur for seasonal and non-seasonal models but the detection for the change point will be slightly lower for the seasonal models, and the procedure does not perform well when the point of change is at the beginning or at the end of the series.

**Brief Biography of the Speaker:** Azami Zaharim worked first 13 years as a lecturer in the Universiti Teknologi MARA (University of MARA Technology - UiTM) before joining the Universiti Kebangsaan Malaysia (National University of Malaysia - UKM) in the year 2003. He is Associate Professor at the Faculty of Engineering and Built Environment UKM, and is currently Coordinator for the Unit Fundamental Engineering Studies. He obtained his BSc(Statistics and Computing) with Honours from North London University, UK in 1988 and PhD (Statistics) in 1996 from University of Newcastle Upon Tyne, UK. He specialize in statistics, public opinion, engineering education and renewable energy resources.

He has until now published over 80 research papers in Journals and conferences, conducted more than 15 public opinion consultancies and delivered 3 keynotes/invited speeches at national and international meetings. He is currently the head of Renewable Energy Resources and Social Impact Research Group under the Solar Energy Research Institute (SERI). In the year 2007, he headed the Engineering Mathematics Research Group. At the same time, he is currently active involve in outcome based education (OBE) approach at the national level and the chairman of the Engineering Education Research Group since 2005. He is also involved actively in the research for the future of engineering education in Malaysia 2006 under the Ministry of Higher Education of Malaysia.

## Plenary Lecture VII

### System Dynamics Models for Business Process Optimization: An Application to Supply Chain Management



**Professor Roberto Revetria**  
University of Genoa  
Reg. Ariano, 27  
17031 Albenga SV,  
ITALY

Email: [revetria@itim.unige.it](mailto:revetria@itim.unige.it)  
Website: <http://st.itim.unige.it>

**Abstract:** In today's global market, managing the entire supply chain becomes a key factor for the successful business. World-class organizations now realize that non-integrated manufacturing processes, non-integrated distribution processes and poor relationships with suppliers and customers are inadequate for their success. They realize the impact of an organization's plan on the other areas of the supply chain. The impact of an organization's plan on the whole supply chain is unpredictable before its execution. That's why system dynamics models are constructed in order to prognosticate and visualize the behavior of the system and to improve its performance.

The use of System Dynamics Modelling in Supply Chain Management has only recently re-emerged after a lengthy slack period. Current research on System Dynamics Modelling in supply chain management focuses on inventory decision and policy development, time compression, demand amplification, supply chain design, and international supply chain management.

Computer simulations are widely used to analyse supply chain dynamics. It is too complex to manage an entire inventory by mathematical analysis because more than two echelons are involved and the inventory management is usually carried out with the aid of computer simulation (Ballou, 1992).

Computer simulations can be divided into the static and dynamics models. The primary difference between them is the way in which they treat timerelated events. Static simulations do not pay enough attention to time-period interplay but the dynamic simulationsevaluate system performance across time (Bowersox, Closs, & Helferich, 1986).

Simulation permits the evaluation of operating performance prior to the execution of a plan. In the practical application of this concept, the development of the simulation model for the supply chain management has become a necessity.

There are different types of computer software for simulations like Dynamo, iThink/Stella, PowerSim, Vensim, AnyLogic, Berkely Madonna, etc. It is possible to perform good system dynamics work with all the above mentioned programs, however in our case we use Berkely MADonna, developed by Robert Macey and George Oster of the University of California at Berkely under the sponsorship of NSF and NIH.

**Brief Biography of the Speaker:** He earned his degree in mechanical engineering at the University of Genoa and he completed his master thesis in Genoa Mass Transportation Company developing an automatic system integrating ANN (Artificial Neural Networks) and simulation with the ERP (Enterprise Resource Planning) for supporting purchasing activities. He had consulting experience in modeling applied to environmental management for the new Bosch plant facility TDI Common Rail Technology in construction near Bari. During his service in the Navy as officer, he was involved in the development of WSS&S (Weapon System Simulation & Service) Project. He

completed is PhD in Mechanical Engineering in 2001 defending his Doctoral thesis on “Advances in Industrial Plant Management” by applying Artificial intelligence and Distributed Simulation to several Industrial Cases. Since 1998 is active in Distributed Simulation by moving US DoD HLA (High Level Architecture) Paradigm from Military to Industrial application. In 2000 he successfully led a research group first demonstrating practical application of HLA in not dedicated network involving a 8 International University Group. He is currently involved, as reseacher, in the DIP of Genoa University, working on advanced modeling projects for Simulation/ERP integration and DSS/maintenance planning applied to industrial case studies (Contracting & Engineering and Retail companies). He is active in developing projects involving simulation with special attention to Distributed Discrete Event and Agent Based Continuous Simulation (SwarmSimulation Agents). He is teaching Modelling & Simulation, VV&A, Distributed Simulation (HLA), Projecty management in Master Courses Worldwide and he is teaching Industrial Plants Design in University of Genoa Masters' Courses. He is member of SCS, IASTED, ACM, ANIMP, AICE, MIMOS and Liophant Simulation Club. He is Associated Professor in Mechanical Engineering and Logistics.

## Special Session I

### High Frequency Circuits and Systems

within the  
8th WSEAS International Conference on  
SIMULATION, MODELLING and OPTIMIZATION  
(SMO '08)

Organized by



**Professor José María Zamanillo Sainz de la Maza**  
UNIVERSIDAD DE CANTABRIA ETSII y Telecomunicación  
Departamento de Ingeniería de Comunicaciones  
Grupo RF & Microondas Avda. de los Castros s/n  
39005 Santander, Cantabria SPAIN  
E-mail address: jose.zamanillo@unican.es

and



**Professor Pablo Luis López Espí**  
UNIVERSIDAD DE ALCALA. Escuela Politécnica Superior  
Departamento de Teoría de la Señal y Comunicaciones  
28805 Alcala de Henares, Madrid. SPAIN  
E-mail address: pablo.lopez@uah.es

#### Topics:

- Modelling of semiconductor technologies
- DC and large signal modelling of semiconductor power devices
- Design and modelling of microwave power amplifiers
- Linearisation
- Transmitter modelling
- Up-down converters
- Passive and waveguide 2D and 3D geometrical models

### **Brief Biography of the Organizers:**

**José M. Zamanillo** was born in Madrid, Spain in 1963. He received B.Sc and Ph.D. degrees in physics from the University of Cantabria, in 1988 and 1996, respectively. Since 1988 he has been devoted to education and research at the University of Cantabria where he is a Professor in the areas of radiofrequency, microwaves and Communication Systems. He has been engaged in various European and Spanish R&D projects, mainly in the fields of microwaves, device modelling, propagation, and television. Presently, his research interests include linear and nonlinear modelling of GaAs MESFETs, HEMTs, and HBTs. Since 2004 up to January 2008, he has been the director of the summer courses of the University of Cantabria, in Laredo, Spain. Actually, he manages the "Aula de Imagen y Sonido" of the University of Cantabria.

**Pablo Luis López Espí** was born in Madrid, Spain in 1972. He received B.Sc from the University of Alcala and M. Sc degrees from the University of Cantabria, in 1996 and 1998, respectively. Since 1998 he has been devoted to education and research at the University of Alcala where he is a Professor in the areas of electromagnetics, microwaves and optical systems. He has been engaged in various European and Spanish R&D projects, especially in application of optical and optimization techniques to water pollution measurement.

## Author Index

Abd Rashid, R.	280	Enache, C.	43
Abdullah, M.	160	Esteve-Asensio, G.	303
Abdullah, S.	153	Exposito, J. E. M.	59
Adam, N. M.	189	Farkas, R.	408
Aja, B.	346	Faro-Rivas, M.	303
Alaiz-Rodriguez, R.	383	Fernández, M.	370
Alegre-Gutierrez, E.	383	Fernández, T.	315
Alejo, R.	401	Ferreira-Rodríguez, C. J.	224
AlGhoul, M. A.	177	Fertalj, K.	195
Amarandei, D.	112	Filote, C.	112
Andrade-Gonzalez, E. A.	65, 138	Fisal, N.	280
Andras, I.	83, 232	Fudholi, A.	177
Arico, C.	70	Fujimoto, K.	395
Ariffin, A. K.	153	Galan, S. G.	59
Artal, E.	346	García, J. A.	298, 315, 370
Babazadeh, M.	47	García, V.	389
Barbat, B. E.	200	Garcia-Gomez, M. A.	138
Barbulescu, C.	27	Garmendia, N.	289
Batos, V.	195	Gavat, I.	142
Beden, S. M.	153	Georgescu, A. V.	200
Bedia, B.	370	Georgiev, V.	204
Berend, G.	408	Gil, A.	122
Berenguer, J.	309	Gilabert, P. L.	309
Bertran, E.	309	Gomez-Nuñez, E.	138
Boussouis, M.	298	González, E. A. A.	224
Bruque, S.	59	Gonzalez, O.	375
Cabria, L.	298, 370	Gonzalez-Castro, V.	383
Calvo, F.	367	Gonzalez-Velez, V.	122
Casado, M. H.	208	Grande, A.	375
Casanueva, A.	375	Grbavac, I.	195
Casas, F. J.	289, 346	Grigore, C.	142
Chereches, T.	43	Grigore, O.	142
Ciufudean, C.	112, 117	Guo, S.	99
Cobo, B.	322, 327, 332, 337, 340	Herran, L. F.	354
Cotescu, M.	142	Ingelmo, H.	327
Daghigh, R.	189	Ismail, M.	160
De La Fuente, M. L.	346	Jedermann, R.	47
De La Rosa, M. G.	401	Jiewang, Z.	99
Diaz-Estebarez, J.	303	Jula, D.	83
Dihrab, S. S.	183	Kayar, M.	214, 219
Domínguez, J.	227	Kljajic, M.	53
El-Bakry, H. M.	261	Kofjac, D.	53
Embong, W. M. A. E. W.	280	Komiya, K.	395

Kotani, Y.	395	Rahnamayan, S.	105
Kovacs, I.	83, 94, 232	Respondek, J. S.	33
Lang, W.	47	Revestido, E.	208
Li, W.	99	Rexhepi, V.	236
Lopez, E.	208	Reyes-Ayala, M.	65, 138, 224
Lopez, P. L.	367	Rivera, S.	322
López-Espí, P. L.	322	Ruslan, M. H.	177
Lupu, C.	78, 170	Sahari, B. B.	189
Lupu, V.	78, 170	Salcedosanz, S.	303
Magalhaes-Mendes, J.	39	Sánchez, F.	315
Marante, R.	370	Sánchez, J. S.	389
Martín-Guerrero, T. M.	370	Sanchez, L.	383
Mastorakis, N.	261	Sanchez, R.	367
Mediavilla, A.	315, 319, 322, 327, 340, 351, 359	Sancho, S.	227
Méndez, J. A. T.	224	Santiago, A. J. S.	59
Merlín, R.	370	Segura, J.	122
Mimouni, A.	315	Shaqiri, R.	236
Mioc, M. A.	148	Simian, C.	204
Mollineda, R. A.	389	Simian, D.	164
Montoro, G.	309	Sopian, K.	177, 183, 189
Morariu, N.	78, 170	Sotoca, J. M.	401
Moyano, E.	208	Suárez, A.	227
Nan, M. S.	83, 94, 232, 242	Surianu, F. D.	27
Navarro, C.	332	Suzdaleva, E.	246
Nopiah, Z. M.	153	Tajima, Y.	395
Oseguera-Cruz, G. D. J.	65	Tazón, A.	315, 359
Othman, M. Y.	177	Tirado-Mendez, J. A.	65, 138
Ozel, Y.	214, 219	Torres, R.	322
Pasamon, J. F.	367	Touhami, N. A.	298, 375
Pascual, J. P.	346	Trana, E.	43
Patrascioiu, C.	133	Tucciarelli, T.	70
Pedro, J. C.	363	Urbanek, J. F.	252, 256
Perez, C.	367	Vega, C. P.	298
Perez-Vega, C.	319, 322, 327, 332, 337, 340, 351, 354, 359	Velasco, F. J.	208
Petre, M.	133	Verdú, M.	315
Popescu, D.	117	Volosencu, C.	127
Popescu, F. D.	94, 232	Wang, G. G.	105
Portilla, J.	289, 332	Yuste, A. J.	59
Portilla-Figuerras, J. A.	303	Zaharim, A.	153, 160, 177, 183, 189, 280
Puente, A. T.	298	Zamanillo, I.	375
Rabahi, I.	133	Zamanillo, J. M.	319, 322, 327, 332, 337, 340, 351, 354, 359, 367
Radu, S. M.	89	Zulkifli, S. S. N.	160
Rahman, M. M.	153	Zulkifly, R.	177



978-968-474-007-9