



COMPUTERS and SIMULATION in MODERN SCIENCE

Volume III

Editors:

***Nikos Mastorakis,
Metin Demiralp,
Valeri M. Mladenov***



Selected papers from WSEAS Conferences

**University of Cambridge (UK),
University of Harvard (USA),
Massachusetts Institute of Technology -- MIT (USA),
China Jiliang University (China),
Beijing Jiaotong University (China),
Univ. Politecnica of Bucharest (Romania),
Technical University of Sofia (Bulgaria),
Tianjin University of Technology and Education (China),
Zhejiang Univ. of Technology (China),
University of Alcala, Madrid (Spain),
University of Cantabria, Santander (Spain),
Budapest Tech (Hungary),
University of La Laguna (Spain),
Politehnica University of Timisoara (Romania)**



COMPUTERS and SIMULATION in MODERN SCIENCE

Volume III

"This book contains important selected papers from WSEAS Conferences organized in the University of Cambridge (UK), University of Harvard (USA), Massachusetts Institute of Technology -- MIT (USA), China Jiliang University (China), Beijing Jiaotong University (China), Univ. Politecnica of Bucharest (Romania), Technical University of Sofia (Bulgaria), Tianjin University of Technology and Education (China), Zhejiang Univ. of Technology (China), University of Alcala, Madrid (Spain), University of Cantabria, Santander (Spain), Budapest Tech (Hungary), University of La Laguna (Spain), Politehnica University of Timisoara (Romania)"

COMPUTERS and SIMULATION in MODERN SCIENCE

Volume III

"This book contains important selected papers from WSEAS Conferences organized in the University of Cambridge (UK), University of Harvard (USA), Massachusetts Institute of Technology -- MIT (USA), China Jiliang University (China), Beijing Jiaotong University (China), Univ. Politecnica of Bucharest (Romania), Technical University of Sofia (Bulgaria), Tianjin University of Technology and Education (China), Zhejiang Univ. of Technology (China), University of Alcala, Madrid (Spain), University of Cantabria, Santander (Spain), Budapest Tech (Hungary), University of La Laguna (Spain), Politehnica University of Timisoara (Romania)"

Published by WSEAS Press

www.wseas.org

Copyright © 2010, 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: 1792-6882

ISBN: 978-960-474-256-1



World Scientific and Engineering Academy and Society

COMPUTERS and SIMULATION

in MODERN SCIENCE

Volume III

"This book contains important selected papers from WSEAS Conferences organized in the University of Cambridge (UK), University of Harvard (USA), Massachusetts Institute of Technology -- MIT (USA), China Jiliang University (China), Beijing Jiaotong University (China), Univ. Politecnica of Bucharest (Romania), Technical University of Sofia (Bulgaria), Tianjin University of Technology and Education (China), Zhejiang Univ. of Technology (China), University of Alcala, Madrid (Spain), University of Cantabria, Santander (Spain), Budapest Tech (Hungary), University of La Laguna (Spain), Politehnica University of Timisoara (Romania)"

Editors:

Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA / Hellenic Naval Academy, GREECE
Prof. Metin Demiralp, Istanbul Technical University, TURKEY
Prof. Valeri M. Mladenov, Technical University of Sofia, BULGARIA

Editor-in-Chief:

Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA / Hellenic Naval Academy, GREECE

Editorial Board:

Prof. Siavash H. Sohrab, Northwestern University, Evanston, Illinois, USA
Prof. Mikhael Wasfy, University of Central Florida, USA
Prof. Slobodan I. Babic, Ecole Polytechnique de Montreal, CANADA
Prof. Yiming Li, National Chiao Tung University, Hsinchu 300, TAIWAN
Prof. Petr Y. Ekel, Pontif. Cathol. Univ. of Minas Gerais, 30535-610, Belo Horizonte, BRAZIL
Prof. Tuan Pham, James Cook University, Townsville, QLD 4811, AUSTRALIA
Prof. M. Isabel Garcia-Planas, Univ. Polit. de Catalunya, C.Mineria 1, 08038, Barcelona, SPAIN
Prof. Demetrios Kazakos, Texas Southern University, 3100 Cleburne Str., Houston, Texas 77004, USA
Prof. Olga Martin, University Politehnica of Bucharest, ROMANIA
Prof. José Mª Zamanillo Sáinz de la Maza, University of Cantabria, SPAIN
Prof. Alexander Zemliak, Puebla Aut. Univ, Av. San Claudio s/n, Ciudad, Puebla, Pue, 72570, MEXICO
Prof. Jose Carlos Quadrado, Electrical Engineering Department, ISEL, Lisbon, PORTUGAL
Prof. Pablo Luis López Espí, Universidad de Alcalá, SPAIN

Preface

This book contains important selected papers from WSEAS Conferences organized in the University of Cambridge (UK), University of Harvard (USA), Massachusetts Institute of Technology -- MIT (USA), China Jiliang University (China), Beijing Jiaotong University (China), Univ. Politecnica of Bucharest (Romania), Technical University of Sofia (Bulgaria), Tianjin University of Technology and Education (China), Zhejiang Univ. of Technology (China), University of Alcala, Madrid (Spain), University of Cantabria, Santander (Spain), Budapest Tech (Hungary), University of La Laguna (Spain), Politehnica University of Timisoara (Romania)

The contents of this Book will be sent to the WSEAS collaborating indices after the conference: **www.worldses.org/indexes**

The contents of this Book are also published in CD-ROM. Both will be sent to the WSEAS collaborating indices after the conference: **www.worldses.org/indexes**

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>**

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) 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

Chapter 1:

- A New Index for Heavy Metals in Biological Monitoring** 13
Mariko Mochizuki, Makoto Mori, Ryo Hondo, Fukiko Ueda

Chapter 2:

- The Computer in the Mathematics Teaching** 23
Ana Julia Viamonte

Chapter 3:

- Data Transmission Errors Detection in Amplitude-Phase Modulated Channels using the Residue Number System** 33
N. G. Bardis, N. Doukas, O. Markovskiy

Chapter 4:

- Maximum Entropy Method Solution for Computer Networks Initial Topology and Feasible Routing** 47
Milan Tuba

Chapter 5:

- Numerical Study of Specific Absorption Rate (SAR) Reduction in Muscle Cube with Metamaterial** 57
Mohammad Rashed Iqbal Faruque, Mohammad Tariqul Islam, Norbahiah Misran

Chapter 6:

- End Winding Inductance of Three-Phase A.C. Machines** 67
Olivian Chiver, Liviu Petrean, Liviu Neamt, Zoltan Erdei

Chapter 7:

- Analysis of a Finite Difference Scheme for a slow, 3-D Permeable Boundary, Navier-Stokes Flow** 77
Joe Hlomuka

Chapter 8:

- On the Design, Simulation and Implementation of an Improved Analog Current Mirror** 93
Nikolaos Charalampidis, Kyriakos Tsiakmakis, Michalis Spasos, Khaled Hayatleh, Nikolaos Mallios

Chapter 9:

- Traffic Control System based on Intelligent Agents** 103
Florin Leon, Mihai Horia Zaharia, Cristea Pal, Stefan Adrian Boronea, Tudor Didilescu

Chapter 10:

- Optimal size of Kanban Board in a Single Stage Multi Product System** 113
T. Murino, G. Naviglio, E. Romano, P. Zoppoli

Chapter 11:

- Autonomous Robot Path Planning in 3D Environments** 123
Ouarda Hachour

Chapter 12:

- Improving Performance and Reliability of Adaptive Fault Tolerance Structure in Distributed Real Time Systems** 133
Negar Mosharraf, Mohammad Reza Khayyambashi

Chapter 13:

- Model of the Usability Evaluation based on the Fuzzy Logic** 144
Miloslav Hub, Michal Zatloukal

Chapter 14:

- Intelligent Decision Support in Intensive Care Units Nursing Information Modeling** 155
Manuel Santos, Filipe Portela, Marta Vilas-Boas, Jose Machado, Antonio Abelha, Jose Neves, Alvaro Silva, Fernando Rua, Maria Salazar, Cesar Quintas, Alexandra Cabral

Chapter 15:

- Intelligent Data Modeling using Mobile Agents** 165
C. I. Popirlan, L. Stefanescu, C. Popirlan

Chapter 16:

- A Colored Data Triggered Architecture for Cryptographic Applications** 175
Hala A. Farouk, Mahmoud El-Hadidi, Magdy Saeb

Chapter 17:

- A Simulation Study of MANET Routing Protocols using Mobility Models** 186
Valentina Timcenko, Mirjana Stojanovic, Slavica Bostjancic Rakas

Chapter 18:

- An Image Search for Tourist Information by using a Mobile Phone** 197
Wichian Premchaiswadi

Chapter 19:

- On Performance of TCP and VoIP Traffic in Mobile WiMAX Networks** 207
Z. S. Bojkovic, D. A. Milovanovic

Chapter 20:

- Enhanced Web Service Discovery with Ghsom** 217
F. Ismaili, Bogdan Shishedjiev, Xhemal Zenuni, Bujar Raufi

Chapter 21:

- Realization Mechanism of Differentiated QoS based on Network Processors** 227
Yechang Fang, Kang Yen, Amaury Caballero, Nansong Wu

Chapter 22:

- Design and Development of an Optimized Low Power Wireless Sensor Network based on ZigBee for Agricultural Applications** 237
Kyriakos Tsiakkakis, Nikolaos Charalampidis, Nikolaos Mallios, Michalis Spasos

Chapter 23:

- Generating Content Recommendation for Adaptive Web-Based Systems** 248
Bujar Raufi, Juliana Georgieva, Artan Luma, F. Ismaili, Xhemal Zenuni

Chapter 24:

- Towards Scalable Real-Time Online Applications in Edutain@Grid** 258
S. Gorlatch, F. Glinka, A. Ploss, T. Fahringer, R. Prodan, V. Nae, M. Surridge, S. Middleton, C. Anthes, A. Arragon, A. Lipaj, C. Rawlings

Chapter 25:

- Using edutainment in e-learning Applications: An Empirical Study** 269
D. Rigas, K. Ayad

Chapter 26:

- The Relationship between Housing Market and the Financial Crisis** 280
Milena Loprete, Antonio Scarpino

Chapter 27:

- Multimodal Metaphors in E-learning Note-Taking** 291
Mohamed S. Sallam, Dimitrios Rigas

Chapter 28:

- Calculating Return on Investment in Business Intelligence** 301
Zeljko Panian

Chapter 29:

- Comparing Virtual Classroom, Game-Based Learning and Storytelling Teachings in E-learning** 311
K. Ayad, D. Rigas

Chapter 30:

- A Controllability and Customisation Approach to Personalised Web Content** 321
Dimitrios Rigas, Khalid Al-Omar

Chapter 31:

- A Decision Model for Reverse Logistics Management using Simulation** 331
L. Guerra, T. Murino, E. Romano

Chapter 32:

- Comparing user Satisfaction and Customisation for Variable Size Personalised Menus** 342
Khalid Al-Omar, Dimitrios Rigas

Chapter 33:

- Bank Loan Processes using BPMN Modelling** 353
G. Mpardis, N. V. Karadimas, V. Nikolopoulos, T. Kotsilieris

Chapter 34:

- Clean Energy and Poor People: Ecological Impacts of Hydroelectric Dams on Fish and Fishermen in the Amazon Rainforest** 363
Renato A. M. Silvano, Anastacio A. Juras, Alpina Begossi

Chapter 35:

- A new Approach for Water Purification from Microbial Pollution** 374
E. Moosavi, V. Martirosyan, S. Ayrapetyan

Chapter 36:

- Risks Influences on the Built Environment** 384
Razvan Oprita

Chapter 37:

- The Influence of the Socio-Economic and Genetic Factors on the Core Temperature of School Pupils, as an Indicator of Stress** 394
Carmen Daniela Domnariu

Chapter 38:

- Sorting Algorithm by Shape Independently from Geometrical Measures** 404
Z. Szakal, I. Zsoldos

Chapter 39:

- Creep and Shrinkage of High Performance Concrete** 413
Cornelia Magureanu, Camelia Negruțiu, Bogdan Heghes, Adela Chiorean

Chapter 40:

- Designing Complex Adaptive Systems as Self-Organized Multi-Agent Hierarchies** 423
R. Dobrescu, D. Hossu, S. Mocanu, D. Popescu

Chapter 41:

- Low Power Semiconductor Devices at 65 nm Technology Node** 434
Kiran Bailey, K. S. GuruMurthy

Chapter 42:

- Energy Saving and the Contribution of Green Marketing to Behavioural Change** 445
Arminda do Paco, Lilia Varejao

Chapter 43:

- ECG Classification by using Wavelet-Domain hidden Markov Models** 462
Pedro R. Gomes, Filomena O. Soares, J. H. Correia, C. S. Lima

Chapter 44:

- Fluid Flow Modeling of a Coastal Fractured Karstic Aquifer by means of a Lumped Parameter Approach** 473
Claudia Cherubini, Concetta Giasi, Nicola Pastore

Chapter 45:

- Conserving Energy using Efficient Lighting** 483
Arvind Dhingra, Tejinder Singh

Chapter 46:

- Wood Energy for Domestic Heating: Extensive Reduction of Toxic Gas and Particulate Matter Emissions by Optimised Control of The Firing Process and use of Gas Sensors** 492
Heinz Kohler, Paul Butschbach, Thomas Trautmann, Hicham Belmir

Chapter 47:

- A Salt and Pepper Noise Reduction Scheme** 503
Nucharee Premchaiswadi, Sukanya Yimngam, Wichian Premchaiswadi

Chapter 48:

- Modelling and Optimization of Check-In Desks and Security Check Points in the Airport Terminal** 513
Guido Guizzi, Teresa Murino, Elpidio Romano

Chapter 49:

- Research Regarding the use of New Systems to Control Fluid Flow in Pipelines** 524
O. Stoicuta, M. S. Nan, G. Dimirache, N. Buda, D. L. Dandea

Chapter 50:

Presentation of a UML System Design for the Medical Healthcare of Mentally Ill Patients after their Rehabilitation in the Society 545

Vasilios Christou, Maria Polizou, Vasilios Apostolopoulos, Andriana Prentza

Chapter 51:

Design and Application of CdS Nanolayers by Chemical Bath Deposition 556

M. C. Acosta-Enriquez, A. Apolinar-Iribar, M. E. Alvarez-Ramos, M. A. Quevedo-Lopez, R. Ramirez-Bon, A. F. Jalbout, A. De Leon, A. Duarte-Moller, R. P. Duarte-Zamorano, L. E. Regalado, M. R. Manzo-Valencia, S. J. Castillo

Chapter 52:

ZnO/glass Substrate Thin-Films and ZnO:SiO₂ Obtained by Soft-Chemistry 567

S. J. Castillo, M. C. Acosta-Enriquez, Ma. E. Zayas, H. Arizpe, T. Mendivil-Reynoso, A. Garcia-Juarez, M. E. Alvarez-Ramos, E. Larios-Rodriguez

Author Index**579**

Author Index

A

Abelha A., 155
Acosta M., 556, 567
Al-Omar K., 321, 342
Alvarez-Ramos M. E., 556, 567
Anthes C., 258
Apolinar-Iribar A., 556
Apostolopoulos V., 545
Arizpe H., 567
Arragon A., 258
Ayad K., 269, 311
Ayrapetyan S., 374

B.

Bailey K., 434
Bardis N. G., 33
Begossi A., 363
Belmir H., 492
Bojkovic Z. S., 207
Boronea S. A., 103
Bostjancic Rakas S., 186
Buda N., 524
Butschbach P., 492

C.

Caballero A., 227
Cabral A., 155
Castillo S. J., 556, 567
Charalampidis N., 93, 237
Cherubini C., 473
Chiorean A., 413
Chiver O., 67
Christou V., 545
Correia J. H., 462

D.

Dandea D. L., 524
De Leon A., 556

Dhingra A., 483
Didilescu T., 103
Dimirache G., 524
Do Paco A., 445
Dobrescu R., 423
Domnariu C. D., 394
Doukas N., 33
Duarte-Moller A., 556
Duarte-Zamorano R. P., 556

E.

El-Hadidi M., 175
Erdei Z., 67

F.

Fahringer T., 258
Fang Y., 227
Farouk H. A., 175

G.

Garcia-Juarez A., 567
Georgieva J., 248
Giasi C., 473
Glinka F., 258
Gomes P. R., 462
Gorlatch S., 258
Guerra L., 331
Guzzi G., 513
GuruMurthy K. S., 434

H.

Hachour O., 123
Hayatleh K., 93
Heghes B., 413
Hlomuka J., 77
Hondo R., 13
Hossu D., 423
Hub M., 144

I.

- Iqbal Faruque M. R., 57
Islam M. T., 57
Ismaili F., 217, 248

J.

- Jalbout A. F., 556
Juras A. A., 363

K.

- Karadimas N. V., 353
Khayyambashi M. R., 133
Kohler H., 492
Kotsilieris T., 353

L.

- Larios-Rodriguez E., 567
Leon F., 103
Lima C. S., 462
Lipaj A., 258
Lopreite M., 280
Luma A., 248

M.

- Machado J., 155
Magureanu C., 413
Mallios N., 93, 237
Manzo-Valencia M. R., 556
Markovskyi O., 33
Martirosyan V., 374
Mendivil-Reynoso T., 567
Middleton S., 258
Milovanovic D. A., 207
Misran N., 57
Mocanu S., 423
Mochizuki M., 13
Moosavi E., 374
Mori M., 13
Mpardis G., 353
Murino T., 113, 331, 513

N.

- Nae V., 258
Nan M. S., 524
Naviglio G., 113
Neamt L., 67
Negar M., 133
Negrutiu C., 413
Neves J., 155
Nikolopoulos V., 353

O.

- Oprita R., 384

P.

- Pal C., 103
Panian Z., 301
Pastore N., 473
Petrean L., 67
Ploss A., 258
Polizou M., 545
Popescu D., 423
Popirlan C. I., 165
Popirlan Cr., 165
Portela F., 155
Premchaiswadi N., 503
Premchaiswadi W., 197, 503
Prentza A., 545
Prodan R., 258

Q.

- Quevedo-Lopez M. A., 556
Quintas C., 155

R.

- Ramirez-Bon R., 556
Raufi B., 217, 248
Rawlings C., 258
Regalado L. E., 556
Rigas D., 269, 291, 311, 321, 342
Romano E., 113, 331, 513
Rua F., 155

S.

- Saeb M., 175
Salazar M., 155
Sallam M. S., 291
Santos M., 155
Scarpino A., 280
Shishedjiev B., 217
Silva A., 155
Silvano R. A. M., 363
Singh T., 483
Soares F. O., 462
Spasos M., 93, 237
Stefanescu L., 165
Stoicuta O., 524
Stojanovic M., 186
Surridge M., 258
Szakal Z., 404

- Zayas M. E., 567
Zenuni X., 217, 248
Zoppoli P., 113
Zsoldos I., 404

T.

- Timcenko V., 186
Trautmann T., 492
Tsiakkakis K., 93, 237
Tuba M., 47

U.

- Ueda F., 13

V.

- Varejao L., 445
Viamonte A. J., 23
Vilas-Boas M., 155

W.

- Wu N., 227

Y.

- Yen K., 227
Yimngam S., 503

Z.

- Zaharia M. H., 103
Zatloukal M., 144