



**Editors: P.Dondon, V.Mladenov, S.Impedovo
and S. Cepisca
Associate Editor: Jaime Lloret**

Mathematical Methods and Computational

Techniques in Research and Education

**Proceedings of the 9th WSEAS Int. Conf. on MATHEMATICAL METHODS AND COMPUTATIONAL
TECHNIQUES IN ELECTRICAL ENGINEERING**

Proceedings of the 6th WSEAS Int. Conf. on NON-LINEAR ANALYSIS, NON-LINEAR SYSTEMS & CHAOS

Proceedings of the 7th WSEAS Int. Conf. on WAVELET ANALYSIS & MULTIRATE SYSTEMS

Proceedings of the 3rd WSEAS Int. Conf. on DYNAMICAL SYSTEMS and CONTROL

Proceedings of the 3rd WSEAS/IASME Int. Conf. on EDUCATIONAL TECHNOLOGIES

Arcachon, France, October 13-15, 2007

**Electrical and Computer Engineering Series
A Series of Reference Books and Textbooks**

ISBN: 978-960-6766-08-4

ISSN: 1790-5117

Published by WSEAS Press

www.wseas.org



Mathematical Methods and Computational Techniques in Research and Education

**Proceedings of the 9th WSEAS International Conference on
MATHEMATICAL METHODS AND COMPUTATIONAL
TECHNIQUES IN ELECTRICAL ENGINEERING (MMACTEE '07)**

**Proceedings of the 6th WSEAS International Conference on
NON-LINEAR ANALYSIS, NON-LINEAR SYSTEMS AND
CHAOS (NOLASC '07)**

**Proceedings of the 7th WSEAS International Conference on
WAVELET ANALYSIS & MULTIRATE SYSTEMS (WAMUS '07)**

**Proceedings of the 3rd WSEAS/IASME International
Conference on DYNAMICAL SYSTEMS and CONTROL
(CONTROL '07)**

**Proceedings of the 3rd WSEAS/IASME International
Conference on EDUCATIONAL TECHNOLOGIES (EDUTE '07)**

Arcachon, France, October 13-15, 2007

Mathematical Methods and Computational Techniques in Research and Education

**Proceedings of the 9th WSEAS International Conference on
MATHEMATICAL METHODS AND COMPUTATIONAL TECHNIQUES IN
ELECTRICAL ENGINEERING (MMACTEE '07)**

**Proceedings of the 6th WSEAS International Conference on NON-
LINEAR ANALYSIS, NON-LINEAR SYSTEMS AND CHAOS (NOLASC '07)**

**Proceedings of the 7th WSEAS International Conference on WAVELET
ANALYSIS & MULTIRATE SYSTEMS (WAMUS '07)**

**Proceedings of the 3rd WSEAS/IASME International Conference on
DYNAMICAL SYSTEMS and CONTROL (CONTROL '07)**

**Proceedings of the 3rd WSEAS/IASME International Conference on
EDUCATIONAL TECHNOLOGIES (EDUTE '07)**

Arcachon, France, October 13-15, 2007

Published by World Scientific and Engineering Academy and Society Press
<http://www.wseas.org>

Copyright © 2007, 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: 1790-5117

ISBN: 978-960-6766-08-4



World Scientific and Engineering Academy and Society

EDITORS:

Professor Philippe Dondon, ENSEIRB, FRANCE
 Professor Valeri Mladenov, Technical University of Sofia, BULGARIA
 Professor Sebastiano Impedovo, Universita degli Studi di Bari, ITALY
 Professor Costin Cepisca, Politehnica University of Bucharest, ROMANIA

ASSOCIATE EDITOR:

Professor Jaime Lloret, Polytechnic University of Valencia, SPAIN

SCIENTIFIC COMMITTEE:

Shahrums Abdullah, MALAYSIA	KyungO Lee, KOREA
Satttar J Aboud, JORDAN	Yuan-horng Lin, TAIWAN
R. Abgrall, FRANCE	Gheorghe Livint, ROMANIA
Tohid Akhlaghi, IRAN	Jaime Lloret Mauri, SPAIN
Mahmood Alfooneh, IRAN	Meechai Lohakan, THAILAND
Horia Andrei, ROMANIA	George Lojewski, ROMANIA
R. Borghi, FRANCE	Manuel J. Lopez, SPAIN
C. Basdevant, FRANCE	Mircea Lupu, ROMANIA
B. Uma Venkataramanaiah, INDIA	R. Lazarov, Livermore, USA
Jan Capek, CZECH REPUBLIC	A. Powell, USA
Bruno Carpentieri, ITALY	N. Markatos, GREECE
Costin Cepisca, ROMANIA	Hossein Marvi, IRAN
Chao-jung Chen, TAIWAN	Dan Mihai, ROMANIA
T.Gallouet, FRANCE	F. Alcrudo, SPAIN
J.M. Ghidaglia, FRANCE	Iordache Mihai, ROMANIA
H. Guillard, FRANCE	Ioana Moisil, ROMANIA
Shun-Ping Chung, TAIWAN	Seung Na, KOREA
Carlos D'Attellis, ARGENTINA	Vincenzo Niola, ITALY
Brunonas Dekeris, LITHUANIA	Marius Ottesteanu, ROMANIA
G.Degrez, BELGIUM	F. Pascal, FRANCE
F. DeVuyst, FRANCE	Edson Paladini, BRAZIL
Radu Dobrescu, ROMANIA	Javier Pereira, SPAIN
Wieslaw Dudek, POLAND	Dana Petcu, ROMANIA
J.M. Herard, FRANCE	Tuan Pham, AUSTRALIA
D.B.Spalding, UK	Maitree Podisuk, THAILAND
Popa Emil Marin, ROMANIA	Ioan Popa, ROMANIA
F. Feistauer, CZECH REPUBLIC	Mohamed Abderrahim, SPAIN
M. Kawahara, JAPAN	Dan Popescu, ROMANIA
Mohammad Mehdi Fateh, IRAN	Nicolae Popoviciu, ROMANIA
Tapio Frantti, FINLAND	Dorina Purcaru, ROMANIA
Jan Gala, CZECH REPUBLIC	E.F. Toro, ITALY
Jean-Marc Galliere, FRANCE	L. Quivy, FRANCE
Aurel Gontean, ROMANIA	D.Yfantis, GREECE
R. Eymard, FRANCE	Mahir Rasulov, TURKEY
D. Kroner, GERMANY	Nicoletta Sala, SWITZERLAND
Victor Grigoras, ROMANIA	Y. Saridakis, GREECE
Athanasios Hatzigaidas, GREECE	M. Seaid, GERMANY
Chen Hong-Ren, TAIWAN	Satya Shah, UNITED KINGDOM
Lin Hsiao-fang, TAIWAN	Irma Irasema Siller Alcala, MEXICO
S.V.Patankar, USA	Dana Simian, ROMANIA
B.E.Launder, UK	Andrej Skraba, SLOVENIA
Kun-Lin Hsieh, TAIWAN	C. Manikopoulos, USA
Guido Izuta, JAPAN	Antonello Spinelli, ITALY
Ichiro Jikuya, JAPAN	Heydar Toossian Shandiz, IRAN
Demetrios Kazakos, USA	Hiroshi Umeo, JAPAN
Turhan Karaguler, TURKEY	Sorin Vlase, ROMANIA
Wilhelm W. Kecs, ROMANIA	George Verros, GREECE
Deniss Kumlander, ESTONIA	Tomasz Walasek, POLAND
Stanislava Labatova, SLOVAKIA	Ping-Jer Yeh, TAIWAN
Cristian Lazaroiu, ITALY	Azami Zaharim, MALAYSIA

**9th WSEAS International Conference on
MATHEMATICAL METHODS AND COMPUTATIONAL
TECHNIQUES IN ELECTRICAL ENGINEERING (MMACTEE '07)
TABLE OF CONTENTS**

Comparative Assessment of the Mobile Phones' EMF Absorption between Adults and Children Head Models <i>Dumitru Cazacu, Constantin Stanescu, Anca Petrisor</i>	1
3D Optimized Reconstruction of a Point-to-Plane Spark Discharge <i>Antonio Amaya-Garcia, Carlos Aviles-Cruz, Jose Luis Hernandez-Avila, Rene Arechiga-Martinez</i>	6
High-Q Quartz Crystal Oscillators Analysis by a 5-Terminal Network Method <i>Nicolas Ratier, Remi Brendel</i>	14
Controller Reduction of Discrete Linear Closed Loop Systems in a Certain Frequency Domain <i>R. Sadeghian, P. Karimaghaee, A. R. Khayatian, M. M. Sheikhhahae</i>	19
A New Technique of Multi-layer Thermal Analysis for VLSI Chips <i>Keiji Nakabayashi, Kazuo Nakajima, Hajimu Iida</i>	24
Advanced Algorithms for Coupled Problems in Electrical Engineering <i>Ion Carstea</i>	31
Advanced Algorithms for Inverse Problems in Electrical Engineering <i>Ion Carstea</i>	39
Digital Sampling Method in the Measurements of Electrical Power and Energy <i>Costin Cepisca, George Seritan, Catalin Ioan Cepisca, Sorin Dan Grigorescu</i>	45
Numerical Simulation of Coupled Fields in High-Voltage Insulation <i>Ion Carstea, Daniela Carstea, Alexandru Carstea</i>	49
Multiblock Method for Database Generation in Finite Element Programs <i>Daniela Carstea</i>	53
Time-Frequency Analysis in Structures Monitoring Subject to Extreme Dynamic Loads <i>Theodor D. Popescu</i>	58
Association Rules Mining for Knowledge Management: A Case Study of Library Services <i>Chu Chai Henry Chan, Ming-Hsiu Lee, Yun-Chiang Kwang</i>	64
A Numerical Simulation of Distributed-Parameter Systems <i>Aurel Chirita, Horia Ene, Bogdan Nicolescu, Ion Carstea</i>	70
Modelling and Simulation of Solitons and Discontinuities in Adiabatic and Ideal Gas and Electrostatic Plasma one Dimensional Systema <i>R. Naidoo</i>	74

**9th WSEAS International Conference on
NON-LINEAR ANALYSIS, NON-LINEAR SYSTEMS AND CHAOS
(NOLASC '07)
TABLE OF CONTENTS**

Control of Network Structure by an External Field on Random Walkers <i>Nobutoshi Ikeda</i>	85
Application of The Variational Iteration Method to The Benjamin-Bona-Mahony (BBM) Equation <i>Emanullah Hizel</i>	91
Identifying Sleep Disorder by Means of Chaos Control <i>Victor Grigoras, Carmen Grigoras</i>	95
Simulation of Kink and Antikink Solitons and their Behaviors <i>M. Mehdi Karkhanehchi, Mohsen Oliaee Fazabad</i>	99
Sub-Pixel Classification of MODIS Images <i>Hasan Roosta, Mohammad Reza Saradjian</i>	103
Ultra Short Pulse Measurement Using High Sensitivity Waveguide Autocorrelator <i>Mohammad Mehdi Karkhanehchi</i>	109

**7th WSEAS International Conference on
WAVELET ANALYSIS & MULTIRATE SYSTEMS (WAMUS '07)
TABLE OF CONTENTS**

Application of Wavelet Transform to Extended X-ray Absorption Spectroscopy <i>H. Funke, M. Chukalina, A. C. Scheinost</i>	117
Fingerprint Recognition for Distorted Image Applications Using Three-Rate Hybrid Kohonen Neural Network <i>Igor Astrov, Svetlana Tatarly, Sergei Tatarly, Ennu Rustern</i>	122
Improving Security of JPEG2000-Based Robust Hashing using Key Dependent Wavelet Packet Subband Structures <i>Gerold Laimer, Andreas Uhl</i>	127
Investigation on Ion Implantation Models Impact on I-V Curve and Thin Film Solar Cell Efficiency <i>F. Jahanshah, K. Sopian, H. Abdullah, I. Ahmad, M. Y. Othman, S. H. Zaidi</i>	133
Effects of PN Junction Position Depth on Output Current of Solar Cell <i>F. Jahanshah, K. Sopian, H. Abdullah, I. Ahmad, M. Y. Othman, S. H. Zaidi</i>	138
Tool Life Monitoring using Coefficient of Integrated Kurtosis-based Algorithm for Z-filter (I-kaz) Technique <i>M. Z. Nuawi, M. J. M. Nor, F. Lamin, S. Abdullah, C. K. E. Nizwan</i>	142
Statistical and Structural Wavelet Packet Features for Pit Pattern Classification in Zoom-Endoscopic Colon Images <i>Michael Liedlgruber, Andreas Uhl</i>	147
Wavelet based Echocardiography Image Denoising <i>M. Salarian, M. R. Karami, E. Nadernejad</i>	153

**3rd WSEAS/IASME International Conference on DYNAMICAL
SYSTEMS and CONTROL (CONTROL '07)
TABLE OF CONTENTS**

Phase Space Research of One Non-autonomous Dynamic System <i>Anton V. Doroshin</i>	161
Energy-Efficient Train Control and Speed Constraints <i>Pavel Pokorny</i>	166
Optimal Design of Multi-loop PI Controllers for Enhanced Disturbance Rejection in Multivariable Processes <i>Truong Nguyen Luan Vu, Moonyong Lee</i>	172
Resonance at Descent in the Mars's Atmosphere of Analogue of the Beagle 2 Lander <i>Vladimir S. Aslanov</i>	178
Effect of Incubation Period of Virus for the Mathematical Model of Dengue Disease <i>Puntani Pongsumpun</i>	182
Dengue Disease Transmission Model of Pregnant and Non-Pregnant Humans <i>Puntani Pongsumpun, Rujira Kongnuy</i>	188
Control of an Interior PM Synchronous Machine for Operating as Integrated Starter-Generator <i>Vasile Horga, Dorin Lucache, Marcel Ratoi, Alecsandru Simion, Mihai Albu</i>	194
4Steel-Robot: A Climbing Mobile Robot for Gas Containers Inspection <i>Armando Segovia, Mayra Garduno, Armida Gonzalez</i>	200
Control Performance Evaluation of a Switching Controller using a Laboratory Scale Plant with Hybrid Dynamics <i>Jaroslav Hlava, Libor Tuma</i>	206
Faults Tolerant Control Application using Neural Networks <i>Lisbeth Perez, Francklin Rivas, Addison Rios, Gloria Mousalli</i>	212
An Original Pre-Tensioning Technique of PMC Tubes for Dynamic Applications <i>Horatiu Teodorescu, Anca Stanciu, Ramona Purcarea, Violeta Munteanu</i>	218
Position Predictive Control for an Induction Motor <i>I. I. Siller-Alcala, M. Abderrahim Fichouche, J. Jaimes-Ponce, R. Alcantararamirez</i>	224
Dynamic Analysis of an Ultra-Lightweight Sandwich Structure for Multiple Applications <i>Horatiu Teodorescu, Sorin Vlase</i>	229
Range-Space Modification of Predictive Control for Parallel Robots <i>Kvetoslav Belda, Josef Bohm</i>	235
Estimating the Region of Attraction of Ordinary Differential Equations by Quantified Constraint Solving <i>Henning Burchardt, Stefan Ratschan</i>	241
Level and Temperature Control Study Using Festo Kit in a Laboratory Stand <i>Matei Vinatoru, Gabriela Canureci, Camelia Maican, Eugen Iancu</i>	247
Experimental Study of Distributed Control for Heat Transfer Processes <i>Matei Vinatoru, Corneliu Vinatoru, Eugen Iancu</i>	253

Use of Functional Programming in the Research on Dynamical Systems and the Deterministic Chaos with the Example of Feigenbaum and Non-Feigenbaum Function Iterations <i>Krzysztof Choromanski</i>	258
Design and Implementation of PID Controller in Programmable Logic Controller for DC Motor Position Control of the Conveyor System <i>Muhammad Sharfi Najib, Mohd Shawal Jadin, Raja M. Taufika Raja Ismail, Mohd Rusllim Mohamed</i>	266
The Design of the Operator Measuring in Fire Control System <i>Martin Macko, Teodor Balaz</i>	271
Transmission Model for <i>Plasmodium Vivax</i> Malaria <i>Puntani Pongsumpun, I-Ming Tang</i>	276
Fuzzy Logic in Decision – Making Process <i>Petr Wolf</i>	282
Decoupled Geometric Control of Glucose and Dissolved Oxygen Concentration for Fedbatch Methionine Production <i>Amalendu P. Ranjan, James Gomes</i>	288
Study of Vibration Suppression of Mechanical Systems with Elastic Elements <i>Luminita Scutaru, Sorin Vlase, Horatiu Teodorescu</i>	294
Neuro – Adaptive Optimal Control System for Aircrafts <i>Romulus Lungu, Mihai Lungu, Nicolae Jula, Costin Cepisca</i>	298
Models Identification and Adaptive Control of the Flying Objects using Neural Networks <i>Romulus Lungu, Mihai Lungu, Nicolae Jula, Costin Cepisca</i>	302
Personal Rapid Transit – Selected Problems <i>Wlodzimierz Choromanski</i>	307
Research and Development for Monitoring and Control System of Cryogenic Pilot Plant with "virtual" Simulation and Data Analyses Process <i>Carmen Maria Moraru, Iuliana Stefan, Liviu Stefan, Ciprian Bucur, Ovidiu Balteanu, Anisia Bornea, Ioan Stefanescu</i>	312

**3rd WSEAS/IASME International Conference on
EDUCATIONAL TECHNOLOGIES (EDUTE' 07)
TABLE OF CONTENTS**

Motivation for Engineering Students to Learn Mathematics: An Illustrative Example <i>Ravelo Hernandez, I. I. Siller-Alcala, J. Jaimes-Ponce, R. Alcantararamirez</i>	319
Practices in Real Time and Simulation for Learning Control Theory <i>I. I. Siller-Alcala, J. Jaimes-Ponce, R. Alcantara-Ramirez, J. P. Vacapliago</i>	324
A Functional Evaluation of the Commercial Platforms and Tools for Synchronous Distance e-Learning <i>Daniel F. Garcia, Christian Uria, Juan C. Granda, Francisco Suarez, Francisco Gonzalez</i>	330
Association between Emotional Reaction and Visual Symbols <i>I-Tsen Liu, Chung-Shan Sun</i>	336
Improving the Student's Mother Language Control in an Electronic Engineer School: "An Illustration with a Robot User Manual American to French Translation" <i>Ph. Dondon, M. Marthiens Dagorette, F. Guillemard, G. Leroyer, R. Charlet</i>	342
Review on UML CASE Tools <i>Wan Hasnira Wan Husin, Siti Hafizah Ab Hamid, Mohd Hairul Nizam</i>	347
Training Higher Education Lecturers in Internet Technologies <i>Carlos Hernandez Franco, Ignacio Bosch Roig, Jorge Gosalbez Castillo</i>	352
u-Learning System based on Memory Theories in Ubiquitous <i>Soo-Hwan Kim, Hyeon-Cheol Kim, Jin-Tea Lee, Seon-Kwan Han, Chul-Hyun Lee</i>	356
Development of the Scale for Diagnosing Online Game Addiction <i>Chulhyun Lee, Seonkwan Han</i>	362
Novel and Stable Lecturers' Point of View about University Students Working Groups <i>Jaime Lloret Mauri, Juan A. Marin-Garcia</i>	368
Design of the Electronic Control System of an Articulated Robot Arm <i>J. J. Rubio Avila, I. I. Siller-Alcala, J. Jaimes-Ponce, R. Alcantara-Ramirez</i>	374
An Overview on E-learning in the Italian Universities and the Efforts of Bari University <i>G. Dimauro, A. Ferrante, D. Impedovo, R. Modugno, G. Pirlo, E. Stasolla, C. A. Trullo</i>	379
Teacher Training through Cooperative Work <i>Victor M. Grassa, Jaime Lloret, Cristina Rodriguez, Lucia Romero, Esther Sanabria, Vicente Sanchis</i>	385
Teamwork with University Engineering Students. Group Process Assessment Tool <i>Juan A. Marin-Garcia, Jaime Lloret Mauri</i>	391
Strategies in University Teachers Training: An Experience of Video Recording in the Universidad Politecnica de Valencia <i>M. Blasco, M. L. Fenollosa, L. Fuster, E. Garcia, P. Sanchis, L. A. Tortajada, J. R. Diaz</i>	397
A Practical Experience towards the new European Higher Education Space <i>Raquel Lacuesta, Guillermo Palacios</i>	402
From Face-to-Face Learning to E-Learning through Blended Learning: An Educational Image-Based Software	408

Tzouvadakis Ioannis, Stamos Athanassios

An Internet Application for Lab-Group Booking Using Open Source Software

412

Margarita Syggouroglou, Leonidas Fragidis, Vassilios Mardiris, Vassilios Chatzis

Latin Language and New Educational Technologies. A Possible Contribution to the Revival of European Cultural Unity

416

P. Camastra, P. Fedeli, M. R. Grattagliano

Learning Control at Undergraduate Level Using PIC 16F877 Microcontroller-Based Temperature Controller

422

Khairurrijal, Mikrajuddin Abdullah, Nur Asiah Aprianti, Suryadi