

**ADVANCES IN APPLIED
MATHEMATICS, SYSTEMS,
COMMUNICATIONS
AND COMPUTERS**

SELECTED PAPERS FROM

- **Communications & Information Technology 2008**
- **Circuits, Systems and Signals 2008**
- **Applied Mathematics, Simulation, Modelling
2008**

Marathon Beach, Attica, Greece, June 1-3, 2008

ADVANCES IN APPLIED MATHEMATICS, SYSTEMS, COMMUNICATIONS AND COMPUTERS

SELECTED PAPERS FROM

- Communications & Information Technology 2008
- Circuits, Systems and Signals 2008
- Applied Mathematics, Simulation, Modelling
2008

Marathon Beach, Attica, Greece, June 1-3, 2008

ISBN: 978-960-6766-69-5 ISSN: 1790-2769

Hosted and Sponsored by the:

HELLENIC AMERICAN UNIVERSITY



<http://www.hau.edu.gr>

HELLENIC AMERICAN UNION



<http://www.hau.gr>

NORTH ATLANTIC UNIVERSITY UNION



<http://www.naun.org>

ISBN: 978-960-6766-69-5

ISSN: 1790-2769

EDITORS:

Prof. Nikos Harkiolakis, Hellenic American University, GREECE
Prof. Dafni Halkia, Hellenic American University, GREECE
Prof. Nikos E. Mastorakis, WSEAS, GREECE
Prof. Vincenzo Niola, University of Naples "Federico II", ITALY
Prof. Anping Xu, Hebei University of Technology, Tianjin, CHINA
Prof. Eleonora Catsigeras, Montevideo, URUGUAY

All the papers of the present volume were reviewed by 2 independent reviewers

STEERING COMMITTEE:

NIKOS MASTORAKIS, Military Institutes of Univ. Education, H. Naval Academy, Greece
RONALD YAGER, Iona College, New Rochelle, NY, USA
AMAURI CABALLERO, Florida International University, Miami, FL, USA
GEORGE VACHTSEVANOS, Georgia Inst. of Technol., Atlanta, GA, USA
ROBERT FINKEL, Physics Dept., St. John's University, USA
DEMETRIOS KAZAKOS, Texas Southern University, USA
THEODORE TRAFALIS, University of Oklahoma, USA
TAKIS KASPARIS, University of Central Florida, USA
ZHIQIANG GAO, Cleveland State University, Cleveland, OH, USA
YAN WU, Georgia Southern University, Statesboro, GA, USA
SPYROS TRAGOUDAS, Southern Illinois University Carbondale, IL, USA
ARKADY KHOLODENKO, Clemson University, USA
GREGORY BAKER, Ohio State Univ, Columbus, Ohio, USA
GALIGEKERE DATTATREYA, University of Texas at Dallas, TX, USA
CAROLINE SWEEZY, New Mexico State University, USA
ASAD SALEM, Texas A&M University- Corpus Christi, USA
DIAN ZHOU, The University of Texas at Dallas, USA
METIN DEMIRALP, Istanbul Technical University, TURKEY
OLGA MARTIN, University Politehnica of Bucharest, ROMANIA
PANOS PARDALOS, University of Florida, USA
CONSTANTIN UDRISTE, University Politehnica of Bucharest, ROMANIA
KLEANTHIS PSARRIS, The University of Texas at San Antonio, TX, USA
ANDREW D. JONES, Florida A&M University, Tallahassee, FL, USA
VALERI MLADENOV, Technical University of Sofia, BULGARIA
NERI F., University of Piemonte Orientale, Alessandria, ITALY
CHEN S. Y., Zhejiang University of Technology, P. R. CHINA
SHYI-MING CHEN, Nat.Taiwan Univ. of Science & Techn, Taipei, R.O.C.
YEN K., Florida International University, Miami, FL, USA
RONG-JYUE FANG, Southern Taiwan University of Technology, TAIWAN
ARGYRIOS VARONIDES, University of Scranton, USA
NIKOLAI KOBASKO, R&D of "IQ Technologies Inc", Akron, Ohio, USA
XU ANPING, Hebei University of Technology, Tianjin 300130, P. R. CHINA
ZHU H., Hiroshima Kokusai Gakuin University, JAPAN

PROGRAM COMMITTEE:
Hans Fernlund, UNITED STATES
Paolo Di Gamberardino, ITALY
Vincenzo Di Lecce, ITALY
Anne-Marie Di Sciullo, CANADA
Zeljko Djurovic, SERBIA
Valentin Dogaru Ulieru, ROMANIA
Tomas Dostal, CZECH REPUBLIC
Maitreyee Dutta, INDIA
Karl Edelmoser, AUSTRIA
Erki Eessaar, ESTONIA
Karim El Guemhioui, CANADA
Hamed Elsimary, EGYPT
Ehsan Esfandiary, IRAN
Mehrez Essafi, TUNISIA
Tchier Fairouz, SAUDI ARABIA
Qi Feng, CHINA
Marta Fernandez, SPAIN
Franco Frattolillo, ITALY
Juan Frausto-Solis, MEXICO
Richard Gallery, IRELAND
Gao Gang-yi, CHINA
Gloria Garcva, SPAIN
Ahmad Ghanbari, IRAN
Baluta Gheorghe, ROMANIA
Ryszard Golanski, POLAND
Alexander Grebennikov, MEXICO
Andrea Guerriero, ITALY
Oscar Gustafsson, SWEDEN
Ofer Hadar, ISRAEL
James Haralambides, UNITED STATES
Suhono Harso Supangkat, INDONESIA
Hafiz Md. Hasan Babu, BANGLADESH
Iraj Hassanzadeh, IRAN
Mohsen Hayati, IRAN
Maria Ines Herrero Platero, SPAIN
Tzung-Pei Hong, TAIWAN
Kuo-Hung Hou, TAIWAN
Michel Houtermans, NETHERLANDS,
Chung-Yuan Huang, TAIWAN
Zhou Huiwei, CHINA
Ren-junn Hwang, TAIWAN
Giuseppe Iazeolla, ITALY
Mohamed Ibrahim, EGYPT
Hiroataka Inoue, JAPAN
Naohiro Ishii, JAPAN
Yousuf Mahbubul Islam, BANGLADESH

Juri Jatskevich, CANADA
Cheng-chang Jeng, TAIWAN
Zhang Jilong, CHINA
C. Jittawiriyankoon, THAILAND
HJ Kadim, UNITED KINGDOM
Rihard Karba, SLOVENIA
Stephen Karungaru, JAPAN
Victor Kasyanov, RUSSIA
Osamu Kata, JAPAN
Demetrios Kazakos, UNITED STATES
Vladimir Kazakov, MEXICO
Ahad Kazemi, IRAN
Mohamad Khaldi, LEBANON
Peter Kokol, SLOVENIA
Samad Kolahi, NEW ZEALAND
Chorng-shiuh Koong, TAIWAN
Guennadi Kouzaev, NORWAY
Deniss Kumlander, ESTONIA
Cheng-chien Kuo, TAIWAN
Dan Lascu, ROMANIA
Mihaela Lascu, ROMANIA
Ljubomir Lazic, YUGOSLAVIA
Minh Hung Le, AUSTRALIA
Shih-kai Lee, TAIWAN
Dong-liang Lee, TAIWAN
Seongkee Lee, KOREA
Yong Woo Lee, KOREA
Huey-Ming Lee, TAIWAN
Somchai Lekcharoen, THAILAND
Sheng-Tun Li, TAIWAN
Chunshien Li, TAIWAN
Ying Li, TAIWAN
Yiming Li, TAIWAN,
Wen-Yew Liang, TAIWAN
Ioan Lie, ROMANIA
S. S. Lin, TAIWAN
Wilfred Lin, HONG KONG S.A.R.
Lily Lin, TAIWAN
Hongbo Liu, CHINA
Ismael Lopez-Juarez, MEXICO
Ye Lu, CHINA
Xiaolin Lu, CHINA
Dan Macodiyo, JAPAN
Zaigham Mahmood, UNITED KINGDOM
Bang-on Makdee, THAILAND
Mrinal Manda, CANADA
Umar Manzoor, PAKISTAN
Marius Marcu, ROMANIA

Yulin Mei, CHINA
Elisabeth Metais, FRANCE
Liyang Mi, JAPAN
Hannah Michalska, CANADA
Wasfy Mikhael, UNITED STATES
Manki Min, UNITED STATES
Huang Minhuan, CHINA
Mihai Mitrea, FRANCE
Payman Moallem, IRAN
Nermin Mohamed, EGYPT
Bouhdai Mohamed, MOROCCO
Farah Mohammadi, CANADA
S. Amirhassan Monadjemi, IRAN
Bartolomeo Montrucchio, ITALY
Eduardo Mosqueira-rey, SPAIN
FRANCESCO Muzi, ITALY
Ibtissem Nafkha, TUNISIA
Benedek Nagy, HUNGARY
Sang-Won Nam, KOREA
Hamed Nassar, EGYPT
Pavel Nevriva, CZECH REPUBLIC
Cat Ho Nguyen, VIETNAM
Elena Niculescu, ROMANIA
Vincenzo Niola, ITALY
Javad Nourinia, IRAN
Juan Jesus Ocampo-Hidalgo, MEXICO
Koji Ohashi, JAPAN
Roland Olsson, NORWAY
Igor Ozimek, SLOVENIA
António Pacheco, PORTUGAL
Zeljko Panian, CROATIA (HRVATSKA)
Eunkwang Park, SINGAPORE
Jin Park, UNITED STATES
Federico Perez, SPAIN
Anna Perez, VENEZUELA
Sakthivel Periyasamy, INDIA
Pisit Phokharatkul, THAILAND
Olivier Ponsini, FRANCE
Mircea Popa, ROMANIA
Dan Popescu, ROMANIA
Mihaela Popescu, ROMANIA
Nenad Popovich, NEW ZEALAND
Ali Pouyan, IRAN
Marius Preda, FRANCE
Sorapak Pukdesri, THAILAND
Mohammadreza Rafiei, IRAN
Dejan Rancic, YUGOSLAVIA
Nicolas Ratier, FRANCE

Rabin Raut, CANADA
Fuji Ren, JAPAN
Dimitrios Rigas, UNITED KINGDOM
Addison Rios-Bolivar, VENEZUELA
Francklin Rivas, VENEZUELA
Mercedes Ruiz, SPAIN
Jean Saade, LEBANON
Raafat Saade, CANADA
Mohammad Ali Sadrnia, IRAN
Ma Sadrnia, IRAN
Iwata Sakagami, JAPAN
Bouhouche Salah, ALGERIA
Enrique San Millan, SPAIN
Usiel Sandler, ISRAEL
Oscar SanJuan, SPAIN
Michael Schwarz, GERMANY
Milos Seda, CZECH REPUBLIC
Tsang-Ling Sheu, TAIWAN
Chao-Cheng Shih, TAIWAN
Khalil Shihab, OMAN
YUE Shihong, CHINA
JeongYon Shim, KOREA
Young-chul Shim, KOREA
Jungpil Shin, JAPAN
Vairis Shtrauss, LATVIA
Carmen Simion, ROMANIA
Dharmender Singh Kushwaha, INDIA
Efstratios Skafidas, AUSTRALIA
Suripon Somkuarnpanit, THAILAND
Hua Song, CHINA
Arnd Steinmetz, GERMANY
Rodica Stoian, ROMANIA
Mu-Chun Su, TAIWAN
Pushpa Suri, INDIA
Miroslav Svvtek, CZECH REPUBLIC
Feruglio Sylvain, FREANCE
Sabin Tabirca, IRELAND
Razvan Tanasie, ROMANIA
Shaohua Tang, CHINA
Wang Tao, CHINA
Stanislaw Tarasiewicz, CANADA
Domenico Tegolo, ITALY
Kah leng Ter, SINGAPORE
Spyros Tragoudas, UNITED STATES
Issa Traore, CANADA
Tsung-Han Tsai, TAIWAN
Ruey-Chyn Tsaur, TAIWAN
Shian-Shyong Tseng, TAIWAN

John Tsiligaridis, UNITED STATES
Kazuhiko Tsuda, JAPAN
Hassan Ugail, UNITED KINGDOM
Hans Vandierendonck, BELGIUM
Francisco Vasques, PORTUGAL
Carlos Velez, COLOMBIA
Fernando Vidal, SPAIN
Luige Vladareanu, ROMANIA
Mirela-Catrinel Voicu, ROMANIA
Toshio Wakabayashi, JAPAN
Shuming Wang, TAIWAN
Yi-shun Wang, TAIWAN
Ruye Wang, UNITED STATES
Lin Wilfred, HONG KONG S.A.R.
Lai Wuxing, CHINA
Tianbing Xia, AUSTRALIA
Weiwen Xu, FRANCE
Koichi Yamada, JAPAN
Kiyotaka Yamamura, JAPAN
Thomas Yang, UNITED STATES
Hung-Jen Yang, TAIWAN
Sheng-Yuan Yang, TAIWAN
Kapseung Yang, KOREA
Shun-Ren Yang, TAIWAN
Hung-Jen Yang, TAIWAN
Ping-Jer Yeh, TAIWAN
Jyh-Yeh, UNITED STATES
Hsu-Chun Yen, TAIWAN
Eng-Thiam Yeoh, MALAYSIA
Huifen Ying, CHINA
Tetsuya Yoshida, JAPAN
Enhai Yu, CHINA
Jian Yu, CHINA
Eugen Zaharescu, ROMANIA
Nadia Zanzouri, TUNISIA
Daniel Zapico, SPAIN
Malika Zazi, MOROCCO
Wenyu Zhang, CHINA
Hong Zheng, CHINA
Hong Zhu, UNITED KINGDOM
Blaz Zmazek, SLOVENIA

The authors of the best papers of these conferences are also invited to submit enhanced and extended versions (no less than 10 pages) to the following international journals. A new round of review is also necessary

**INTERNATIONAL JOURNAL OF
MATHEMATICAL MODELS AND METHODS
IN APPLIED SCIENCES**

**INTERNATIONAL JOURNAL OF
MATHEMATICS AND COMPUTERS IN SIMULATION**

**INTERNATIONAL JOURNAL OF CIRCUITS,
SYSTEMS AND SIGNAL PROCESSING**

INTERNATIONAL JOURNAL OF COMMUNICATIONS

INTERNATIONAL JOURNAL OF COMPUTERS

**INTERNATIONAL JOURNAL OF EDUCATION
AND INFORMATION TECHNOLOGIES**

Είμαστε Εραστές της Ομορφιάς με εντελώς απέρριπτο τρόπο
Είμαστε Εραστές της Σοφίας άνευ μαλθακότητας
(The Love of what is beautiful does not lead to extravagance,
The Love of Spirit does not make us soft)

FUNERAL ORATION (ATHENS, 430 BC) of PERICLES
In Thucydides, History of Peoloponnesian War, Book 2, Chapter 40, Section 1

NAUN:

In 2000, a number of prominent members of the academic community from countries of North America and Europe decided to set up a new organization, named NORTH ATLANTIC UNIVERSITY UNION (NAUN), whose main purposes are to promote initiatives aiming at enhancing scientific exchanges, disseminating information, coordinating research networks and technology transfer in the field of Science and Engineering within the Union. After some years, we started organizing conferences (2006) and have some scientific journals also. Our goals are to promote the cooperation between the university professors and academic scholars in various fields of science and engineering and to cultivate an environment for the advance and development of modern science. Our objective includes: Promoting the interactions between the scientists and engineers. Advancing the applications of scientific methodology and engineering techniques to the society and industry. Facilitating the exchange of information and ideas among the engineers and scientists. NAUN is also focusing on advanced technologies, tomorrow's products and inventions, and promotes them through various events and publications. NAUN is relying on its individual and corporate membership support, active scientists, tight relationships with existing scientific organizations (ACM, ACS, AMS, IET, IEEE, WSEAS, etc.), and customized relationships with standard bodies (ITU, IETF, TMF, etc.) NAUN targets national academia and national universities for membership and promotion. NAUN intends scholarship support for participants to different events it organizes and promotes equal access to community resources. The overall aim of NAUN is to develop a series of knowledge transfer mechanisms, particularly directed towards the exchange of information between academics and professional users within industry. This is achieved through a range of activities organised by a dedicated team of staff both within the Institute and its associate companies. A large network of prestigious contacts and links have been established with many organisations throughout the world. The NAUN network is coordinated by several university professors in USA (see committees of the journals and conferences) on a rotating base.

Hellenic American University:

The Hellenic American Union was instrumental in the founding of the Hellenic American University, and continues to substantially support its operations in Athens, Greece. The Hellenic American University is a non-profit institution of tertiary education, chartered in the State of New Hampshire, USA, which is committed to providing an American university education that draws upon innovative developments in educational technology and methodology and adapts them to the environments of contemporary Athens and beyond. The mission of the Hellenic American University is to be a leading provider of the highest quality American graduate and undergraduate education that is globally focused, inter-culturally informed, and career oriented. Serving Greece and other countries in the Balkans, the Middle East, and Eastern Europe, it prepares its graduates to contribute to economic and social development locally, regionally, and internationally. You can find further information about the University at www.hau.edu.gr or you may contact the University at 30-210-368-0950 and ask to speak with Olga Asvestopoulou. The ACADEMIC PROGRAMS at HELLENIC AMERICAN UNIVERSITY exemplify our Mission to make excellent and career-relevant American higher education available to students in Athens, Greece.

CONTENTS

A Generalized Discrete Event Model to Support Railway Freights Logistics: Methodology and Case Study	17
Claudia Caballini, Pier Paolo Puliafito, Roberto Revetria, Flavio Tonelli	
Finding Critical Region for Testing the Presence of Additive Outlier (AO) in GARCH (1,1) Processes By The Method of Simulation	24
Azami Zaharim, Siti Meriam Zahid, Mohammad Said Zainol, Ibrahim Mohamed	
Modeling Volatility of the KLCI Daily Returns	28
Azami Zaharim, Siti Meriam Zahid, Mohammad Said Zainol, Ibrahim Mohamed	
Analysis of model equations on interactions between the immune system and the HIV/AIDS virus	33
Nabendra Parumasur and Robert Willie	
New Block Lanczos Algorithm	42
Ana Paula Lopes, Ana Julia Viamonte, António José Pascoal	
Simulation of different configuration of hybrid Photovoltaic Thermal Solar Collector (PVTs) Designs	44
Adnan Ibrahim, Kamaruzzaman Sopian, Mohd Yusof Othman, M.A.AIGhoul, Azami Zaharim	
An indirect boundary element method with vortex distribution and linear boundary elements for the compressible fluid flow around obstacles	50
Luminiña Grecu	
Numerical Modeling of Heat and Mass Transfer in Permeable Media	56
M. Rosca, M. Antics, and K. Karytsas	
Simulation of a Residential Solar Assisted Air Conditioning System in Malaysia	62
K. Sopian, S.Mat, B. Ali, M.Y. Sulaiman, M.A. AIGhoul, A.Zaharim	
A new approach of irredundant covering selection	68
Adrian Zafiu, Ilie Popa	
Information systems infrastructure and VOIP: from expectations to reality	73
Seppo Sirkemaa	
Research of the ARP Spoofing Principle and a Defensive Algorithm	77
Yang Liu, Kaikun Dong, Lan Dong and Bin Li	
Agent-Based Elearning Environment	81
Aboubekour Hamdi-Cherif , Chafia Kara-Mohammed , Alias Hamdi-Cherif	

Fuzzy Modelling to Enhance Cooperative Management Seyed A. Shahrestani	88
Pairwise Sequence Alignment Revisited - Genetic Algorithms and Cosine Functions Mohammed Benothman, Gamil A. Azim, Aboubekeur Hamdi-Cherif	94
Integrating Traditional and Fuzzy Controllers for Mobile Satellite Antenna Tracking System Design Po-Kuang Chang and Jium-Ming Lin	102
On one approach to random testing of MIPS microprocessors Igor Gribkov, Alexey Zakharov, Petr Koltsov, Nikolay Kotovich, Alexander Kravchenko, Alexander KoutsaeV, Andrey Osipov, Ildar KhisambeeV	109
Signal detection for neural network-based antenna array Maja Sarevska	115
Target recognition improvement using the decision fusion between HRR and video imagery Iulian-Constantin Vizitiu, Ioan Nicolaescu, Petrică Ciotîrnaie, Doru Munteanu, Cristian Molder	120
Theoretical Methods and Practical Aspects in Continuous Time System Identification Virginia Finca, Radu Zglimbea, Constantin Marin	126
Identification of Systems with Friction via Distributions using the simplified Dahl model Radu Zglimbea, Virginia Finca, Constantin Marin	133
TMR2: an enhanced MR2 with a lightweight user trust model Samad Kardan and Mehdi Shajari	139
The influence of the sheet thickness on springback effect in case of TWB's forming Aurelian Albut	147
The Operations on Matrix for Assignment Problem L.Y. Yang, M.H. Nie, Z.W. Wu, Y.Y. Nie	151
Modified Evolutionary Particle Swarm Optimization for AVR-PID tuning M. L. Amer, Hanafy H. H. Hassan, Hosam K. M. Youssef	164
Numeric modeling for lake water changes of China Ge Yu, and Huadong Sheng	174
On one approach to random testing of MIPS microprocessors Igor Gribkov, Alexey Zakharov, Petr Koltsov, Nikolay Kotovich, Alexander Kravchenko, Alexander KoutsaeV, Andrey Osipov, Ildar KhisambeeV	184

Employing Fuzzy Trust Levels to Improve Wireless Network Reliability	190
H. Hallani and S. A. Shahrestani	
Healthcare Information Systems in Greece: System and Human Integration	196
Christos Bogdanos, Manos Lagouros, and Lambros Ekonomou	
Information Technology as a Management Tool in Automation Processes of sanitation Facilities	201
Marcelo De Souza, Sergio Luiz Pereira, Caio Fernando Fontana and Eduardo Mário Dias	
Development of a Physical Interface to Interact with a Virtual Laparoscopic Environment	207
Daniel Posada, Christian A. Diaz, Helmuth Trefftz and Jorge Bernal	
Postgraduate Students' Perceived Attitudes Toward Statistics and Competency in Statistical Data Analysis	213
Z. Mahmud, M.S. Zainol	
Automatic Composition and Reasoning in Computational Multi-agent Systems	221
Roman Neruda	
Face Recognition Algorithm Using Discrete Gabor Transform	227
Gualberto Aguilar-Torres, Gabriel Sanchez-Perez, Mariko Nakano-Miyatake, Hector Perez-Meana	
MHD simulation of a coaxial plasma opening switch in an RLC circuit	234
M.T. Mehrabani, A. Abbassi, M. M. Attaran	
A new approach to deterministic and non-deterministic decisional systems minimization - principles and results	240
Ion Stefanescu, Adrian Zafiu	
Improving link reliability in mobile ad hoc networks using fuzzy nodes	252
Saeid Haji Nasiri, Mahmood Fathy, Esmaeil Zeinali Khosrafi, Amirhossein Shojaeifard	
Tribological Behaviour in a Motor with Turbocompressor Utilizing the Finite Element Method (F.E.M.)	256
Vincenzo Niola, Giuseppe Vitale	
Efficient HRV analysis using wavelet package transform	261
Gley Kheder, Abdennaceur Kachouri and Mounir Samet	
An efficient model for traffic simulation	265
Adrian Zafiu, Constantin Ghita	
Mass Transfer Modeling in a Packed Bed of Palm Kernels under Supercritical Conditions	270
Kamaruzaman Jusoff, Norlia Ismail, Norhuda Ismail	
Author Index	275