RECENT RESEARCHES in APPLIED MATHEMATICS and ECONOMICS

Proceedings of the 6th International Conference on Applied Mathematics, Simulation, Modelling (ASM '12)
Proceedings of the 6th International Conference on Management, Marketing and Finances (MMF '12)

Vouliagmeni Beach, Athens, Greece
March 7-9, 2012

Sponsored and Supported by
Universita Degli Studi di Genova, Italy
and
Technical University of Sofia, Bulgaria

Published by WSEAS Press
www.wseas.org
RECENT RESEARCHES in APPLIED MATHEMATICS and ECONOMICS

Proceedings of the 6th International Conference on Applied Mathematics, Simulation, Modelling (ASM '12)
Proceedings of the 6th International Conference on Management, Marketing and Finances (MMF '12)

Vouliagmeni Beach, Athens, Greece
March 7-9, 2012
Editors:
Prof. Tsutomu Kambe, University of Tokyo, Japan
Prof. Cornelia Aida Bulucea, University of Craiova, Romania
Prof. Charalampos Arapatsakos, Democritus University of Thrace, Greece

Associate Editors:
Associate Prof. Nikolaos G. Bardis, University of Military Education - Hellenic Army Academy, Greece
Assistant Prof. Klimis Ntalianis, Technological Educational Institute of Athens, Greece

International Program Committee Members:
Morris Adelman, USA
Robert L. Bishop, USA
Glenn Louy, USA
Fernando Alvarez, USA
Mark J. Perry, USA
Leon O. Chua, USA
Brian A. Barsky, USA
K. R. Rao, USA
Bimal K. Bose, USA
Joseph Sifakis, FRANCE
Sidney Burrus, USA
Biswa Nath Datta, USA
Panos Pardalos, USA
Ronald Yager, USA
Stamatios Kartalopoulos, USA
Lotfi A. Zadeh, USA
Nikos E. Mastorakis, BULGARIA
Gamal Elnagar, USA
Stephen Anco, CANADA
Adrian Constantin, SWEDEN
Ying Fan, CHINA
Juergen Garloff, GERMANY
Y. Jiang, UK
Hans Fernald, USA
Paolo Di Giambardino, ITALY
Vincenzo Di Lece, ITALY
Anne-Marie Di Sciuollo, 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-Solís, MEXICO
Richard Gallery, IRELAND
Gao Gang-yi, CHINA
Gloria Garc a, SPAIN
Ahmad Ghanbari, IRAN
Baluta Gheorghe, ROMANIA

Ryszard Golanski, POLAND
Alexander Grebennikov, MEXICO
Andrea Guerriero, ITALY
Oscar Gustafsson, SWEDEN
Markus Hadar, ISRAEL
James Haralambides, USA
Suhono Harso Supangkat, INDONESIA
Hafiz Md. Hasan Babu, BANGLADESH
Iraj Hassanzadeh, IRAN
Mohsen Hayati, IRAN
Maria Ines Herrero Platero, SPAIN
Tzung-Pei Hou, TAIWAN
Michel Houtermans, NETHERLANDS
Chung-Yuan Huang, TAIWAN
Zhou Huiwei, CHINA
Ren-junn Hwang, TAIWAN
Giuseppe Iazeolla, ITALY
Mohamed Ibrahim, EGYPT
Hirotaka Inoue, JAPAN
Naohiro Ishii, JAPAN
Yousuf Mahbubul Islam, BANGLADESH
Juri Jatskevich, CANADA
Cheng-chang Jeng, TAIWAN
Zhang Jilong, CHINA
C. Jittawiriyankoon, THAILAND
HJ Kadim, UK
Rihard Karba, SLOVENIA
Stephen Karungaru, JAPAN
Victor Kasyanov, RUSSIA
Osamu Kata i, JAPAN
Demetrios Kazakos, USA
Vladimir Kazakov, MEXICO
Ahad Kazemi, IRAN
Mohamad Kahlid, LEBANON
Peter Kokol, SLOVENIA
Samad Kolahi, NEW ZEALAND
Chorn-shiu 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
Issa Traore, CANADA
Tsung-Han Tsai, TAIWAN
Ruey-Chyn Tsaur, TAIWAN
Shian-Shyong Tseng, TAIWAN
John Tsiligaridis, USA
Kazuhiko Tsuda, JAPAN
Hassan Ugail, UK
Hans Vandierendonck, BELGIUM
Francisco Vasques, PORTUGAL
Carlos Velez, COLOMBIA
Fernando Vidal, SPAIN
Luige Vladareanu, ROMANIA
Mirela-Catrinel Voicu, ROMANIA
Tosio Wakabayashi, JAPAN
Shuming Wang, TAIWAN
Yi-shun Wang, TAIWAN
Ruye Wang, USA
Lin Wilfred, HONG KONG
Lai Wuxing, CHINA
Tianbing Xia, AUSTRALIA
Weiwen Xu, FRANCE
Koichi Yamada, JAPAN
Kiyotaka Yamamura, JAPAN
Thomas Yang, USA
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, USA
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, UK
Blaz Zmazek, SLOVENIA
# Table of Contents

Plenary Lecture 1: Dynamic GP Models: An Overview and Recent Developments  
*Jus Kocijan*  
(12)

Plenary Lecture 2: E-learning Methodology Development Model  
*Sarma Cakula*  
(13)

Plenary Lecture 3: Conditions of Experiments for Verification of Gravity Control Possibility  
*Vitaly O. Groppen*  
(14)

Set-Norm Variation of Set-Multifunctions  
*Anca Croitoru, Gabriela Apreutesei, Nikos Mastorakis*  
(15)

Risk Based Process for Funding Scheme Evaluation of Public Private Partnerships  
*Athanassios C. Karmperis, Anastasios Sotirchos, Konstantinos Aravossis, Ilias P. Tatsiopoulos*  
(20)

Conditions of Experiments for Verification of Gravity Control Possibility  
*Vitaly O. Groppen*  
(26)

 Variation of Kinetic Friction Coefficient with respect to Impact Velocity in Tube Type Energy Absorbers  
*W. M. Choi, T. S. Kwon*  
(30)

Dynamic GP Models: An Overview and Recent Developments  
*Jus Kocijan*  
(38)

The Universe Modeling by Variable Measurement Standards  
*Vitaly O. Groppen*  
(44)

A Low Rank Tensorial Approximations Method of Computation of Singular Values and Singular Vectors for SVD Problem  
*A. Milnikov*  
(49)

The Mathematical Model of the Order Realizing System  
*Robert Bucki, Bronislav Chramcov*  
(54)

New Formulations for the Generalized Traveling Salesman Problem  
*Imdat Kara, Huseyin Guden, Ozge N. Koc*  
(60)

Adsorption Energy and Stability of H2O and CO2 on Calcite Effect by Short-Range Force Field Parameters and Temperature  
*Phan Van Cuong, Tatiana Kuznetsova, Bjørn Kvamme, Bjørnar Jensen*  
(66)

From Prosopagnosia to Image Processing: Feature Enhancement Module  
*Mihaela Costin*  
(73)
Ranking of Candidates in the Preferential Voting Framework Based on a New Approach
Ali Ebrahimnejad

Neural Signal Processing Scheme and its Application to Multiple Sound Source Location
Yumi Takizawa, Atsushi Fukasawa

Design of a Model for Heat Demand Prediction Using the Neural Network Synthesis
Bronislav Chramcov, Pavel Vařacha

Deterministic and Stochastic Dynamic Model with Delays of the Financial Crises Contagions
Aura Loredana Ciudariu, Mihaela Neamtu

Does the Generosity_Creativity_Solidarity Triad (and Integrated Project) Matter on the Triadic MMF ’12 Conference Pluri-Domain: Management, Marketing and Finances?
Nicolae Bulz, Alexandru Bogdan, Sorin Chelmu, Amalia Strateanu

Application of the Organized Map in 3D
Claude Ziad Bayeh, Nikos E. Mastorakis

Identification of Success Factors in E-Service Delivery of Commercial Order Registration in the Government of Islamic Republic of Iran
Masoud Pourkiani, Sanjar Salajeghe, Mehdi Bagheri

Natural Cubic Interpolating Spline for the Heat Capacity of Gadolinium
Bakhodirzhon Siddikov

How Consumers Assess Product’s Features?: A Case Study of Product Features of Smartphone
Wee-Kheng Tan, Yi-Der Yeh, Shin-Jia Chen, Yu-Cheng Lin, Chia-Yu Kuo

Accounting Ethics: Some Research Note
Carmen Bonaci, Jiří Strouhal

The Aspects of Product Placement as a Marketing Tool in the Czech Republic
Jan Kramoliš, Martina Drábková

Development of Legal Framework of Mergers on the Territory of Today’s Czech Republic before 1938
Konečný Alois, Valouch Petr

Development of Small and Powdery Waste Management
Socalici Ana, Harau Carmen, Heput Teodor, Ardelean Erika

Lean Production Systems in Practice
David Tuček, Jaroslav Dlábač

New Approaches of Quality Concept in Current Context
Amalia Venera Todorut, Doru Cîrnu
Plenary Lecture 1

Dynamic GP Models: An Overview and Recent Developments

Professor Jus Kocijan
Jozef Stefan Institute
Ljubljana, Slovenia
&
University of Nova Gorica
Nova Gorica, Slovenia
E-mail: jus.kocijan@ijs.si

Abstract: Various methods can be used for nonlinear, dynamic-systems identification and Gaussian process model is a relatively recent one. The Gaussian-process model is an example of a probabilistic, nonparametric model with uncertainty predictions. It possesses several interesting features like model predictions contain the measure of confidence. Further, the model has a small number of training parameters, a facilitated structure determination and different possibilities of including prior knowledge about the modelled system. The framework for the identification of dynamic systems with Gaussian-process models will be presented and an overview of recent advances in the research of dynamic systems identification with Gaussian-process models and its applications will be given.

Brief Biography of the Speaker:
Jus Kocijan received the doctorate in electrical engineering from the Faculty of Electrical Engineering, University of Ljubljana, Slovenia. He is currently a senior researcher at the Department of Systems and Control, Jozef Stefan Institute and Professor of Electrical Engineering at the School of Engineering and Management, University of Nova Gorica, Slovenia. His other experience includes: running a number of international and domestic research projects, serving as editor and on editorial boards of research journals, serving as a member of IFAC Technical committee on Computational Intelligence in Control. His main research interests are: applied nonlinear control and multiple model and probabilistic approaches to modelling and control. He is a Senior member of IEEE, Control Systems Society, a member of SLOSIM – Slovenian Society for Simulation and Modelling and Automatic control society of Slovenia.
Plenary Lecture 2

E-learning Methodology Development Model

Professor Ph.D. Sarma Cakula
Faculty of Engineering
Vidzeme University of Applied Sciences
Cesu 4, Valmiera
LATVIA
E-mail: sarma.cakula@va.lv

Abstract: One of the most important prerequisites in base plan for long-term development of all countries is high education level in society what includes e-learning studies. With the progression of e-learning in society there is exponential growth of e-learning resources or knowledge items on the internet observed. Most of e-learning systems do not take into account individual aspects of person, ignoring the different needs that are specific to existing cognitive profiles. Teachers have been forced to search for possibilities to make e-learning more interesting and effective. The goal of the paper is to work out and create theoretical principles of using imitation modelling for e-learning course developing for building course methodology for individual use, according to the person's characteristics and performance, depending also on the concepts that the person knows. Simulation and modeling computer programs are concerned with construction of models for analyzing different perspectives and possibilities in changing conditions environment. The paper presents theoretical justification and evaluation of qualitative e-learning development model in perspective of advancing modern technologies. Theoretically grounded and practically tested model of developing e-learning methods using different technologies for different type of classroom, which can be used in professor's decision making process to choose the most effective e-learning methods has been worked out.

Brief Biography of the Speaker:
Sarma Cakula was born at 13th December 1960 in Latvia. Graduated with excellence from Latvia University Department of Physics and Mathematics in 1984 and holds Ph.D. in 2002. She started to work in Vidzeme University College (Vidzeme University of Applied Sciences –now) as a teacher. She is a director of Information Technology (IT) professional bachelor program and the Dean of Faculty of Engineering of Vidzeme University of Applied Sciences Latvia now. She is a professor of Information Technologies in the Faculty of Engineering. Also she manages some European and Norway fund projects. She is a member of the International E-Learning Association (IELA), the Latvian Information Technology and Telecommunications Association (LIKTA) and Latvian Universities Professor Association (LAPA). She has more than 30 scientific publications from 2006 in field of information technologies and pedagogic, mostly of them in the field of E-Learning. Also she takes part in Scientific Committee of different international conferences and Editorial Advisory on international journals. Latest of them are: International Online Workshop On "Writing a Research Paper"(IOW-WRP), July 17, 2011,Organized and Technically Co-Sponsored by MASAUM Network; International Conference Virtual and Augment Reality in Education (Vare 2011), 18th March, 2011, Valmiera, Latvia; International Conference on Intelligent Computing & Information Systems, Cairo-Egypt 2011; International Journal of Cyber Society and Education” ISSN 1996-6649 from 2009 , International Conference „LEAF" 2010”, 2010.g. 3-5.Jun. Hammamet, Tunisia, International Online Conference on Information Technology (IOCT ’11), October 30, 2011 and others.
Plenary Lecture 3

Conditions of Experiments for Verification of Gravity Control Possibility

Professor Vitaly O. Groppen
Scientific-Research Institute of Applied and Theoretical Informatics
North-Caucasian Institute of Mining and Metallurgy
Russia
E-mail: groppen@mail.ru

Abstract: The proposed approach is based on the idea of measurement standards variability used for the Universe simulators development. This approach permits us to predict some features of the Universe: spontaneous growth of distance between two resting objects detected by an observer at one of these objects, velocity/distance dependence is known to meet the Hubble Law, thus negating the idea of dark energy distribution in the Universe, constancy of any solid body linear dimensions in time is believed to be caused by linear measurement standard shortening as well as by a loss of mass of physical objects. The latter permits us, interpreting the Hubble constant as a coefficient, characterizing the rate of mass loss by any physical body, to propose simulators, describing gravity and inertia as manifestations of reaction forces, thus giving us a possibility to control gravity. Conditions of gravity control experiments are determined by means of series of tentative experiments.

Brief Biography of the Speaker:
Vitaly Groppen graduated from the North-Caucasian Institute of Mining and Metallurgy, Russia in 1967. In the 1960s he worked as an Assistant Professor at the Department of Industrial Electronics in the North-Caucasian Institute of Mining and Metallurgy, Vladikavkaz, North Ossetia, Russia. In 1973 he graduated from postgraduate courses in the Institute of Control Science of Russian Academy of Sciences (Moscow, 1970 – 1973) and worked as the Head of Computing Centre of North-Caucasian Institute of Mining and Metallurgy (1973 – 1980) and as an assistant (1973 – 1976) and as Docent (1976 -1988) at the Department of Mathematics in the same institution. In the 1980s he continued as Senior Specialist of the Data Processing Department in the Dresden Technical University (German Democratic Republic, Dresden, 1980), and in the Leipzig Technical Higher School (German Democratic Republic, Leipzig, 1985). Since 1987 until 1989 he is Professor and Head of the Department of Mathematics in the North-Caucasian Institute of Mining and Metallurgy, North Ossetia, Russia, but from 1989 until now – founder and head of the Automated Data Processing Department in the same Institution. In the 1990s he was a visiting Lecturer in the Catalonia Technical University (Barcelona, Spain, 1990) and in the LG Research Centre (Seoul, Republic Korea, 1995). Since 1999 he is member of European Mathematical Society (Helsinki, Finland) and since 2008 he is the Director of the Scientific-Research Institute of Applied and Theoretical Informatics (Vladikavkaz, North Ossetia, Russia). His research interests are focused on mathematical modeling, astronomy, physics, optimization theory and its’ applications, graphs theory, discrete programming, theory of games, taxonomy, solutions making theory, computer aided images processing, optimal program codes design. He is the author of about 116 papers, 5 patents and 6 monographs.
Authors Index

Apreutesei, G. 15  Karmperis, A. C. 20
Aravossis, K. 20  Koc, O. N. 60
Ardelean, E. 156  Kocijan, J. 38
Bagheri, M. 116  Konečný, A. 150
Bayeh, C. Z. 107  Kramoliš, J. 144
Bogdan, A. 98  Kuo, C.-Y. 131
Bonaci, C. 138  Kuznetsova, T. 66
Bucki, R. 54  Kramoliš, J. 144
Bulz, N. 98  Kwon, T. S. 30
Chelmu, S. 98  Lin, Y.-C. 131
Chen, S.-J. 131  Mastorakis, N. E. 15, 107
Choi, W. M. 30  Milnikov, A. 49
Chramcov, B. 54, 86  Neamtu, M. 92
Ciudariu, A. L. 92  Pourkiani, M. 116
Cîrnu, D. 167  Salajeghe, S. 116
Costin, M. 73  Siddikov, B. 125
Croitoru, A. 15  Socalici, A. 156
Cuong, P. V. 66  Sotirchos, A. 20
Dlabač, J. 161  Strateanu, A. 98
Drábková, M. 144  Strouhal, J. 138
Ebrahimnejad, A. 78  Takizawa, Y. 82
Fukasawa, A. 82  Tan, W.-K. 131
Groppen, V. O. 26, 44  Tatsiopoulos, I. P. 20
Guden, H. 60  Todorut, A. V. 167
Harau, C. 156  Tuček, D. 161
Heput, T. 156  Valouch, P. 150
Jensen, B. 66  Vařacha, P. 86
Kara, I. 60  Yeh, Y.-D. 131