



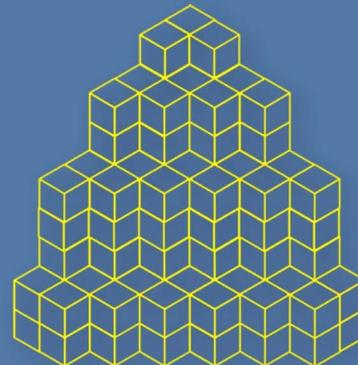
**Editors: Manoj K. Jha, Myriam Lazard, Azami Zaharim,
Kamaruzzaman Sopian**

Applied Mathematics in Electrical & Computer Engineering

- **Proceedings of the American Conference on Applied Mathematics (AMERICAN-MATH '12)**
- **Proceedings of the 6th WSEAS International Conference on Circuits, Systems, Signal and Telecommunications (CSST '12)**
- **Proceedings of the 6th WSEAS International Conference on Computer Engineering and Applications (CEA '12)**



Harvard, Cambridge, USA, January 25-27, 2012



ISBN: 978-1-61804-064-0



APPLIED MATHEMATICS in ELECTRICAL and COMPUTER ENGINEERING

**Proceedings of the AMERICAN CONFERENCE on APPLIED
MATHEMATICS (AMERICAN-MATH '12)**

**Proceedings of the 6th WSEAS International Conference on
CIRCUITS, SYSTEMS, SIGNAL and TELECOMMUNICATIONS
(CSST '12)**

**Proceedings of the 6th WSEAS International Conference on
COMPUTER ENGINEERING and APPLICATIONS (CEA '12)**

**Harvard, Cambridge, USA
January 25-27, 2012**

APPLIED MATHEMATICS in ELECTRICAL and COMPUTER ENGINEERING

**Proceedings of the AMERICAN CONFERENCE on APPLIED
MATHEMATICS (AMERICAN-MATH '12)**

**Proceedings of the 6th WSEAS International Conference on
CIRCUITS, SYSTEMS, SIGNAL and TELECOMMUNICATIONS
(CSST '12)**

**Proceedings of the 6th WSEAS International Conference on
COMPUTER ENGINEERING and APPLICATIONS (CEA '12)**

**Harvard, Cambridge, USA
January 25-27, 2012**

Published by WSEAS Press
www.wseas.org

Copyright © 2012, 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 no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: <http://www.worldses.org/review/index.html>

ISBN: 978-1-61804-064-0



World Scientific and Engineering Academy and Society

APPLIED MATHEMATICS in ELECTRICAL and COMPUTER ENGINEERING

**Proceedings of the AMERICAN CONFERENCE on APPLIED
MATHEMATICS (AMERICAN-MATH '12)**

**Proceedings of the 6th WSEAS International Conference on
CIRCUITS, SYSTEMS, SIGNAL and TELECOMMUNICATIONS
(CSST '12)**

**Proceedings of the 6th WSEAS International Conference on
COMPUTER ENGINEERING and APPLICATIONS (CEA '12)**

**Harvard, Cambridge, USA
January 25-27, 2012**

Editors:

Professor Manoj K. Jha, Morgan State University, USA
Professor Myriam Lazard, Institut Supérieur d'Ingenierie de la Conception, France
Professor Azami Zaharim, Universiti Kebangsaan Malaysia, Malaysia
Professor Kamaruzzaman Sopian, Universiti Kebangsaan Malaysia, Malaysia

International Scientific Committee:

Ahmed Boutejdar, Germany
Olga Martin, Romania
Panos Pardalos, USA
Kabir Mashud, Germany
Ronald Yager, USA
Amauri Caballero, USA
Nikos Mastorakis, Bulgaria
Mueller Soeren, Germany
George Vachtsevanos, USA
Robert Finkel, USA
Demetrios Kazakos, USA
Zhiqiang Gao, USA
Cayrel P-Louis, Germany
Yan Wu, USA
Spyros Tragoudas, USA
Arkady Kholodenko, USA
Gregory Baker, USA
Theodore Trafalis, USA
Takis Kasparis, USA
Galigeke Dattatreya, USA
Caroline Sweezy, USA
Asad Salem, USA
Dian Zhou, USA
Thimm Heiko, Germany
Daowen Qiu, China
Metin Demiralp, Turkey
Kleanthis Psarris, USA
Andrew D. Jones, USA
Valeri Mladenov, Bulgaria
Neri F., Italy
Chen S. Y., P. R. China
Shyi-Ming Chen, R. O. C.
Yen K., USA
Rong-Jyue Fang, Taiwan
Argyrios Varonides, USA
Nikolai Kobasko, USA
Xu Anping, P. R. China
Zhu H., Japan
Joseph Sifakis, France
Lotfi A. Zadeh, USA
Leon O. Chua, USA
K. R. Rao, USA
Dimitri Bertsekas, USA
Biswa N. Datta, USA
Irwin Sandberg, USA
A. Manikas, UK
T. Kaczorek, Poland
Wlodzislaw Duch, Poland
Sidney Burrus, USA
Leonid G. Kazovsky, USA
Georgios B. Giannakis, USA

Nikolaos G. Bourbakis, USA
Brian A. Barsky, USA
Ryszard S. Choras, Poland
Wasfy B. Mikhael, USA
M. Kostic, USA
A. Venetsanopoulos, Canada
K. Benra, Germany
S. Sohrab, USA

Preface

This year the AMERICAN CONFERENCE on APPLIED MATHEMATICS (AMERICAN-MATH '12), the 6th WSEAS International Conference on CIRCUITS, SYSTEMS, SIGNAL and TELECOMMUNICATIONS (CSST '12) and the 6th WSEAS International Conference on COMPUTER ENGINEERING and APPLICATIONS (CEA '12) were held in Harvard, Cambridge, USA. The conferences provided a platform to discuss linear algebra, numerical analysis, differential equations, probabilities, statistics, operational research, optimization, algorithms, discrete mathematics, computers, circuits, systems, signal processing, telecommunications, networks etc. with participants from all over the world, both from academia and from industry.

Their success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of these conferences are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

Conferences such as these can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

Table of Contents

Plenary Lecture 1: Market Efficiency and Behavioral Finance: A Unifying Stochastic Model of Stock Prices <i>Sergio Bianchi</i>	15
Plenary Lecture 2: Convergence Speed and Population Dynamics in the AK Model with Habit Formation <i>Massimiliano Ferrara</i>	17
Plenary Lecture 3: Swarm Intelligence Algorithms Parameter Tuning <i>Milan Tuba</i>	19
Plenary Lecture 4: A Possible Solution of Trisection Problem <i>Siavash H. Sohrab</i>	20
Plenary Lecture 5: Minimal surfaces and their controlled evolution <i>Constantin Udriste</i>	21
Plenary Lecture 6: Optimal FIR Estimation of Analog Quantities in Discrete-Time State Space <i>Yuriy S. Shmaliy</i>	22
Plenary Lecture 7: Specific role and positioning of the telecommunications solution in the Intelligent Transport Systems <i>Tomas Zelinka</i>	23
Plenary Lecture 8: Investigating the Viability of Hybrid and Electric Automobiles by Understanding the Influence of Road Design, Traffic Congestion, and Driver Behavior on Vehicle Power Uses <i>Manoj K. Jha</i>	24
Plenary Lecture 9: Non-traditional Approach to Computer Energy Reduction <i>Vasily G. Moshnyaga</i>	25
Plenary Lecture 10: Combining Virtual and Augmented Reality to Improve the Mechanical Assembly Training Process in Manufacturing <i>Amaury Andres Peniche Gonzalez</i>	26
Plenary Lecture 11: Create a Self-Modeling DSS in the Cloud: Perspectives, Methodologies and Case Studies <i>Roberto Revetria</i>	27
Plenary Lecture 12: A Long-Term Information Service for Professional Development <i>Lung-Hsing Kuo</i>	28
Modeling Gap Acceptance and Driver Behavior at Stop Controlled (Priority) Intersections in Developing Countries <i>Rene Lord-Attivor, Manoj K. Jha</i>	29
Navigation Assistance and Lane Detection Using the Topology Wavefront Strategy <i>Clayton G. Thomas Jr., Manoj K. Jha</i>	39

Transit Service Indicators for Alternative Route Structure Analysis <i>Timothy F. Welch, Sabyasachee Mishra, Manoj K. Jha</i>	45
Assembly Flowshop Scheduling Problem to Minimize Total Tardiness <i>Ali Allahverdi, Harun Aydilek</i>	51
The Converging Under-Damped Harmonic Growth of Prime Numbers <i>Ernest G. Hibbs</i>	54
A Simple Heuristic to Find Efficiently k-Nearest Neighbors in Flocking Behaviors <i>Jae Moon Lee, Hye-Kyung Cho</i>	60
Manufacturing and Shipment Policy Making for an Integrated System with Rework and a Cost Lessening Product Delivery Plan <i>Singa Wang Chiu, Kuang-Ku Chen, Yuan-Shyi Peter Chiu, Shin-Wei Chen, Ming-Syuan Song</i>	65
Alternative Approach for Manufacturing and Shipment Policy Making for a System with Rework and a Cost Lessening Product Delivery Plan <i>Yuan-Shyi Peter Chiu, Singa Wang Chiu, Chih-Kai Chang, Chiu-Yen Shen</i>	71
Seismic Wave in Magnetoelastic Irregular Anisotropic Layer <i>Amares Chattopadhyay, Sanjeev A. Sahu</i>	77
Monotonicity of NFP Mappings Associated with Variational Inequality and Its Application <i>Hemant Kumar Pathak</i>	83
On a General Formula for Computing the One-Dimensional Differential Transform of Nonlinear Functions and Its Applications <i>Abdelhalim Ebaid</i>	92
Wind Speed Modeling and Prediction in Wind Farms Using Fuzzy Logic <i>Shahram Javadi, Zeinab Hojjatinia</i>	98
On Experiments Taken by the Active Shock Absorber Test Stand <i>Katerina Hyniova, Ladislava Smitkova-Janku, Jaroslav Honcu, Antonin Stribrsky</i>	104
An Efficient Approach to Speed up the Search Process during Fractal Matching Process <i>Hsiao-Wen Tin, Shao-Wei Leu, Shun-Hsyun Chang</i>	110
2D Text Visualization for the Retrieval of Malay Documents <i>Normaly Kamal Ismail, Tengku Mohd Tengku Sembok</i>	116
Position Function in Mathematics <i>Claude Ziad Bayeh, Nikos E. Mastorakis</i>	122
Advanced Modeling Methodology Based on System Dynamics in Healthcare <i>Revetria R., Mosca R., Cassetari L., Guizzi G., Romano E., Santillo L. C.</i>	127
Comparing Image Classification Methods: K-Nearest-Neighbor and Support-Vector-Machines <i>Jinho Kim, Byung-Soo Kim, Silvio Savarese</i>	133

Diverse Factorial Operators	139
<i>Claude Ziad Bayeh, Nikos E. Mastorakis</i>	
Bounded Solutions of a Fifth Order Model Equation for Steady Capillary-Gravity Waves over a Bump with the Bond Number Near 1/3	145
<i>Chung-Hsien Tsai, Shy-Jen Guo</i>	
Snubber Circuit Designed for Electric Car Drive System	149
<i>Sakrawee Raweekul</i>	
Opposition Product in Mathematics	153
<i>Claude Ziad Bayeh, Nikos E. Mastorakis</i>	
Numerical Solution of Two-Point Boundary Value Problems Using Sinc Interpolation	157
<i>Kenzu Abdella</i>	
Effect of First- and Second-Order Extensions on UFIR Filtering of Nonlinear Models	163
<i>Felipe Ramirez-Echeverria, Jose Contreras-Gonzalez, Yuriy S. Shmaliy</i>	
Efficient Denoising of Piecewise-Smooth Signals with Forward-Backward FIR Smoothers	169
<i>Osbaldo Vite-Chavez, Roberto Olivera-Reyna, Jorge Munoz-Minjares, Yuriy S. Shmaliy, Oscar Ibarra-Manzano, Luis Morales-Mendoza</i>	
An Analysis of Errors in RFID SAW-Tag Systems with Pulse Position Coding	175
<i>Yuriy S. Shmaliy, Gustavo Cerda-Villafana, Oscar Ibarra-Manzano, Victor Plessky</i>	
Application of a Parking Enforcement System Using Smartphones	181
<i>Doyeon Kim, Choonki Song, Jaejoon Kim</i>	
Self-Adjointness and Conservation Laws for a New Integrable Equation	187
<i>Maria Luz Gandarias, Maria Santos Bruzon</i>	
An Object Tracking System for PTZ Cameras Using CAM Shift	191
<i>Sang Gu Lee, Ji Hoon Jo</i>	
Sine Dot Product	195
<i>Claude Ziad Bayeh, Nikos E. Mastorakis</i>	
A Mathematical Model for the Quantitative Analysis of Law. Putting Legal Values into Numbers	201
<i>Massimiliano Ferrara, Angelo Roberto Gaglioti</i>	
Mathematical Modelling of Brown Seaweed Drying Curves	207
<i>Ahmad Fudholi, Mohd Hafidz Ruslan, Lim Chin Haw, Sohif Mat, Mohd Yusof Othman, Azami Zaharim, Kamaruzzaman Sopian</i>	
An Algorithm to Implement a Fluoroscopic Stereo System Using a Single Simulated Fluoroscope and an Optical Navigator	212
<i>Mario Donnici, Michele Perrelli, Paola Nudo, Guido Danieli</i>	
Educational Software in WEB – Based Teaching	217
<i>Danimir Mandic, Danijela Krasic-Kostadinovic</i>	

Decision Support System in Modern Education <i>Danimir Mandic, Nada Vilotijevic, Ivko Nikolic</i>	222
Application of Computer Algebra Approach to Solve Engineering Problems - A Case Study: Power Supply Stabilization Loop Circuit <i>Tamiyo Nakabayashi, Keiji Nakabayashi, Fujio Kako</i>	228
Improvement of Supply Chain Efficiency with a Computer Learning Game <i>Ken Dozier, David Chang</i>	234
The Probabilistic Model of Random Variation in Nanoscale MOSFET's High Frequency Performance <i>Rawid Banchuin</i>	240
Techno-Economics Analysis of a Wind/PV Hybrid System to Provide Electricity for a Household in Malaysia <i>Ahmad Fudholi, Mohd Zamri Ibrahim, Mohd Hafidz Ruslan, Lim Chin Haw, Sohif Mat, Mohd Yusof Othman, Azami Zaharim, Kamaruzzaman Sopian</i>	246
The Applications Using Data Envelopment Analysis <i>Tasho Tashev, Asya Angelova</i>	251
Design of Replicated Real-time Database Simulator <i>Hala Abdel Hameed, Hazem M. El-Bakry, Torky Sultan</i>	254
Improving Drilling Operations Management Using Combined Simulation <i>Revetria R., Testa A., Cassetari L., Guizzi G., Romano E., Gallo M.</i>	263
Combined Simulation for improving Operations in LNG Logistics: A Case Study <i>Giribone P., Guizzi G., Murino T., Romano E., Revetria R., Testa A.</i>	271
A Possible Solution of Trisection Problem <i>Siavash H. Sohrab</i>	277
FPGA Based IR Code Recognizer <i>Alghamdi Ali S., Kenaya Riyadh L.</i>	286
Combining Virtual and Augmented Reality to Improve the Mechanical Assembly Training Process in Manufacturing <i>Amaury Peniche, Christian Diaz, Helmuth Trefftz, Gabriel Paramo</i>	292
Measurement of Rasch Analysis towards Requirement Engineering Education: Industry Perspective <i>Nor Azliana Akmal Jamaludin, Shamsul Sahibuddin</i>	298
A Fundamental Frequency Extraction Method Based on Windowless and Normalized Autocorrelation Functions <i>M. A. F. M. Rashidul Hasan, Tetsuya Shimamura</i>	305
WEB Portals for Supporting Relations between Physical Condition and Learning Abilities <i>Danimir Mandic, Danica Dzinovic, Dragan Martinovic</i>	310

Specific Telecommunications Solutions for ITS Applications	315
<i>Tomas Zelinka, Miroslav Svitek, Zdenek Lokaj</i>	
Advanced Model of Intelligent Transport Systems	323
<i>Miroslav Svitek, Tomas Zelinka, Michal Jerabek</i>	
Improving the Prediction Accuracy of Liver Disorder Disease with Oversampling	331
<i>Hyontai Sug</i>	
Real Time Scheduling Verification with Incomplete Information	336
<i>Maurizio Talamo, Andrea Callia D'Iddio, Christian H. Schunck, Franco Arcieri</i>	
Mathematical and Virtual Model for Mechanical Structures with Free Connecting Rod	345
<i>Elena Mereuta, Marian Tudoran, Daniel Ganea, Claudiu Mereuta</i>	
Local Estimation of Stock Market Efficiency	349
<i>Sergio Bianchi, Alexandre Pantanella, Augusto Pianese</i>	
Evaluation of Local Content Strategies to Plan Large Engineering Projects in the Oil & Gas Industry in High Risk Country Areas	356
<i>De Falco Massimo, Gallo Mose, Santillo Liberatina Carmela, Troncone Enzo Piermichele, Pier Alberto Viecelli</i>	
Self-Adjointness and Conservation Laws for a Benjamin-Bona-Mahony Equation	363
<i>Maria S. Bruzon, Maria L. Gandarias</i>	
Analysis of Demand Variability in a Kanban Cell by Virtual Kanban Strategy	366
<i>Cassettari L., Gallo M., Montella D. R., Revetria R., Romano E., Testa A.</i>	
A World Class Manufacturing Implementation Model	371
<i>Murino T., Naviglio G., Romano E., Guerra L., Revetria R., Mosca R., Cassettari L. C.</i>	
On Integer Sequences Derived from Balanced k-ary Trees	377
<i>Sung-Hyuk Cha</i>	
Scheduling Activity Based on Hybrid Manufacturing Systems	382
<i>Chiocca D., Guizzi G., Naviglio G., Iuliano A., Revetria R., Mosca R., Cassettari L. C.</i>	
Swarm Intelligence Algorithms Parameter Tuning	389
<i>Milan Tuba</i>	
Modified Seeker Optimization Algorithm for Unconstrained Optimization Problems	395
<i>Ivona Brajevic, Milan Tuba</i>	
On an Elementary Proof for a Class of Elliptic Over-Determined Problems in a Doubly Connected Domain	401
<i>Lakhdar Ragoub</i>	
Artificial Fish Swarm Algorithm for Unconstrained Optimization Problems	405
<i>Nebojsa Bacanin, Milan Tuba, Nadezda Stanarevic</i>	

An Object-Oriented Implementation of the Firefly Algorithm for Continuous Unconstrained Optimization Problems <i>Milos Subotic, Ivan Mistic, Milan Tuba</i>	411
Software Framework for Testing JPEG Quantization Tables for Iris Recognition <i>Ana Tuba, Jovo Arezina, Raka Jovanovic</i>	417
Modified Approximation Method for Identification of Nonlinear Systems Using Volterra Models in Frequency Domain <i>Vitaliy Pavlenko, Viktor Speransky, Vladimir Ilyin, Vladimir Lomovoy</i>	423
On Design and Control of Oscillation Using Limit Cycles <i>Hassan Fathabadi, Nikos E. Mastorakis</i>	429
Effective Use of Technology Can Improve the Quality and Productivity of Machining Operation of Fuze Shop <i>Shafqat Hameed, Muhammad Abid Abbas, Irfan Ghalib</i>	436
Authors Index	446

Plenary Lecture 1

Market Efficiency and Behavioral Finance: A Unifying Stochastic Model of Stock Prices



Professor Sergio Bianchi

Rector's Delegate for Research and Benchmarking
Faculty of Economics - University of Cassino
Via S. Angelo, Campus Folcara - 03043 CASSINO (FR)
ITALY
E-mails: sbianchi@eco.unicas.it

Abstract: Reams and reams have been written in quantitative finance about the unsolved problem of the stock markets efficiency. Starting from the seminal work of Fama (1970), who defined the Efficient Market Hypothesis in terms of expected values conditional to the informative set ("financial assets fully reflect all available information that is relevant to their values"), a huge number of works have tried to address the question whether real financial markets behave efficiently. Roughly speaking, the EMH argues that market does price assets broadly correctly, excluding that deviations from equilibrium values could last for long. So great was the consensus met by the EMH to set one of the most impressive bodies of knowledge of the 20th century: the mathematical finance.

Nonetheless, the number of equilibrium theorems proved under the assumptions of the EMH grew at the same rate of the empirical evidence that made questionable the validity of the EMH itself.

Many approaches have been followed in literature to test the EMH. In spite of all the efforts, to date the problem remains open and current more than ever, basically because of two main reasons:

- the analyses, particularly those aiming at testing the random walk model in its different specifications, often provide non conclusive results;

- the real world dynamics, with their repeated financial crises made of bubbles and crashes, seriously do challenge the credibility of the EMH, to the extent that a strand of skeptical thought, the behavioural finance, has been booming. One of the most quoted works in this context is due to DeBondt and Thaler (1985); they show that using historical returns abnormal profits are achievable in the long-run, simply going short a portfolio of 'winner stocks' (i.e., stocks with good performances in the past) and going long a portfolio of 'loser stocks' (i.e., stocks that performed badly in the past). What causes these opposite profits, according to the authors, is investors' excess of optimism and pessimism, the so called overreaction to information. Following this analysis, a plethora of contributions provided evidence of reverse abnormal profits and documented them in international markets and for short time horizons. Other empirical results suggest that prices underreact to information in a way to generate the so called the "momentum" profit; the trading strategy in this case consists in going long a portfolio of extremely winner stocks in the past and going short a portfolio of extremely loser stocks.

Results like those just recalled raise the question whether a model exists able to make consistent all these opposite findings. The paper concludes in favour of an affirmative answer: a model is discussed that, recently defined by Ayache and Taqqu (2005) in a general setting, succeeds in reconciling efficiency and behavioural finance. The model, named Multifractional Processes with Random Exponent (MPRE), emanates from the well-known fractional Brownian motion (fBm), the unique Gaussian process, self-similar of order H , vanishing at the origin with stationary increments, introduced to model long-range dependence. The parameter H of the fBm is informative of the intensity of dependence and of the regularity of the process' paths. Yet, the constancy of H is undesirable for many phenomena, whose complexity requires the pointwise regularity to change over time, even abruptly. When H is replaced by a random function one gets the MPRE. The construction of this class of processes considers (a) a Gaussian field depending on H and the time domain, and (b) a random variable or a stochastic process with values in an arbitrary fixed compact interval. The resulting process is versatile enough to describe very complex phenomena such as stock price dynamics..

Brief Biography of the Speaker: Sergio Bianchi, born on 25 September 1967, graduated in 1991 from University of Cassino (Italy) in Economics. He earned his Ph.D. in Actuarial Science from University of Rome "La Sapienza" (Italy). After teaching experiences as invited professor at the Pontifical Gregorian University (Vatican State) and at University of Sassari (Italy), in 1998 was appointed assistant professor at University of Cassino, where became associate professor in 2001 and full professor of Mathematics and Financial Mathematics in 2006. Since 2003 to 2005 he was scientific responsible for the Computer Laboratory of the Department "Economia e Territorio" at University of Cassino.

He also held the office of Head of the Department "Istituzioni, Metodi Quantitativi e Territorio" from 2005 to 2009, when he resigned after the appointment as Rector's Delegate for Research and Benchmarking. Member of the board of professors of the Ph.D. in Economics at the same University, he is referee for a number of international journals and the author of more than fifty research papers concerning the modeling of financial time series by (multi)fractional processes and self-similar stochastic processes.

Plenary Lecture 2

Convergence Speed and Population Dynamics in the AK Model with Habit Formation



Professor Massimiliano Ferrara

Department SSGES

Mediterranean University of Reggio Calabria

Via dei Bianchi, 2, Reggio Calabria, 89127

ITALY

E-mail: massimiliano.ferrara@unirc.it

Abstract: AK-type models with habit formation have been used in the literature to address a wide variety of issues. For example, through numerical simulations, Carroll et al have shown that the introduction of habit formation in the standard AK endogenous growth model may cause this model to exhibit transitional dynamics, while Gomez has proved that the convergence speed of the AK model with external habits is higher than that in the AK model with internal habits. It is known that usually standard economic growth theory assumes that labor (population) force grows at a positive constant rate (Malthusian model). However, this assumption is not a good approximation to reality as population exponentially grows without limits, which is clearly unrealistic. To remove the prediction of unbounded population size in the very long-run, Verhulst wrote an alternative model, known as the logistic growth model, where the population stock evolves according to an elongated S-curve. Recent forecasts (e.g., United Nations) confirm that the annual growth rate of population is expected to fall gradually until 2100, and that world population will stabilize at a level of about eleven billion people by 2200. Thus, not only theoretically but also empirically, it seems reasonable to model population size as following a logistic process. Bucci and Guerrini, Ferrara and Guerrini, Germana' and Guerrini, and Guerrini, have recently explored the implications of studying some economic growth models within a framework where the change over time of the labor force is non constant but governed by the logistic law or by a bounded population growth rate. In this paper, we wish to investigate the dynamic effects of assuming a logistic population growth hypothesis in Gomez's model. This set-up leads the economy to be described by a four dimensional dynamical system, whose unique non-trivial steady state equilibrium is a saddle point with a two dimensional stable manifold. Two stable roots, rather than only one as in Gomez, determine the speed of convergence. Now, the crucial determinant of the asymptotic speed of convergence is the larger of the two negative eigenvalues. As a result, contrary to Gomez, the asymptotic speed of convergence may be not necessarily decreasing as the value of some parameter increases.

Brief Biography of the Speaker: Massimiliano Ferrara is Associate Professor of Mathematical Economics at "Mediterranea" University of Reggio Calabria where he was also Dean of the degree in Economics (2007-2010). Actually he is the Director of Department - Culture, Education, Research and University at Regione Calabria. He was the Founder and Director of MEDAlics (2009) – Research Centre for Mediterranean Studies - and Vice Rector at "Dante Alighieri" University of Reggio Calabria. He was also Visiting Professor at Morgan State University in Baltimore (USA), Western Michigan University (USA), New Jersey Institute of Technology in Newark (NJ) (USA). He is co-author of the research work on "Knowledge flows and technological trajectories in the Mediterranean Area" published in 2009 on African Journal of Science, Technology, Innovation and Development, and for volume "Economics and International Cooperation in the Mediterranean Area" for Rubbettino Editore. Invited Speaker by WSEAS Conferences (Baltimore MACMESE '09 Morgan State University) by American Mathematical Society (Western Michigan University, USA) and Calcutta Mathematical Society, INDIA and Visiting Professor at the Lomonosov Moscow State University (Department of Mathematics), at the New Jersey Institute of Technology in NewArk (NJ) (USA), (Department of Mathematical Sciences), at the Eotvos Lorand University of Budapest (Department of Atomic Physics, Faculty of Sciences), at Politehnica of Bucharest (Department of Mathematics). Author of 105 publications on international journals many of them "high impact Scientific International (ISI)" and 5 monographs. Member of Indian Academy of Mathematics (2008- current), Member of Accademia Peloritana dei Pericolanti (2003-current), Member of the Balkan Society of Geometers (2003- current), Member of AMASES - Associazione di Matematica Applicata alle Scienze Economiche e Sociali - (2003- current), Member of the Scientific SET - Advances Center for Studies on Economic Theory - (Center for Advanced Studies Theoretical Economics) at the University of Milan Bicocca (2005-current), Member of the Mathematical Association of America (2007-current), Member of the SIEP (Societa italiana di Economia Pubblica) (2008-current). Scientific Coordinator of international

projects financed by the Ministry of Foreign Affairs:the Executive Programme of scientific and techonological cooperation between Italy and Romania during 2006- 2008 and of the Executive Programme of scientific and technological cooperation between Italy and Estonia during 2005-2007. Editor and referree of several International Journals. Official Reviewer of Mathematical Reviews (MathSciNet), Division of the American Mathematical Society and Zentralblatt MATH, reviews scientific journal published by the European Mathematical Society, the Heidelberg Academy of Sciences and Fachinformationszentrum Karlsruhe. His main research interests are: dynamical systems, patterns of growth and sustainable development, mathematical economics, game theory, optimization theory, applied Economics.

Plenary Lecture 3

Swarm Intelligence Algorithms Parameter Tuning



Professor Milan Tuba
University Megatrend Belgrade
Faculty of Computer Science
Serbia
E-mail: tuba@ieee.org

Abstract: Most real-life problems can be represented as some kind of optimization problem. Easy optimization problems were solved long time ago so nowadays only hard problems are of research interest. Many discrete (combinatorial) as well as some continuous optimization problems are intractable, but of great practical interest. Traveling salesman problem (TSP) is a classic example that was researched for the longest period of time and because of that is often used as a benchmark.

The main problem with hard optimization problems is that there is enormous number of suboptimal solutions or local minima and there is no guidance how to search. Standard down-hill methods in this situation fail. Typical example of such function that is used as a benchmark is Rastrigin function that is a sphere modified by small cosine waves.

The oldest way to deal with such problems is Monte-Carlo method. It is equivalent of trying to find the deepest point in the oceans by measuring many times the depth at random locations and hoping that best measurement will be close to the global optimum. While Monte-Carlo method is usable for some applications, its blind search is not sufficient for many others. In this rather hopeless situation researchers turned from mathematically exact methods to belief. The nature is doing miraculous things. We know the results but we do not understand the mechanism. For hard optimization problems we try to mimic some nature processes. Older attempts included simulation of evolution (through genetic modifications and survival of the fittest) and simulated annealing. Recently, swarm intelligence become prominent using the fact that extremely simple individuals exhibit miraculous collective intelligence. Examples include ants colonies, honey bees colonies, flocks of birds, schools of fish etc.

These nature inspired metaheuristics simulate various natural phenomena. We talk about bee colony food finding or ant colony path finding, but in essence, in all these diverse mimicking we do two things. We exploit good found solutions, but also go to unknown places in order to avoid being trapped in local minima. The successfulness of any such algorithm is determined by proper balance between exploitation and exploration. This balance is maintained by adjusting certain parameters and also by applying some rules in certain situations. By doing such adjustments algorithm can become much better for some class of problems (off course, according to NFL theorem, it cannot become universally good for all problems). This plenary lecture will demonstrate few successful examples of such adjustments.

Brief Biography of the Speaker: Milan Tuba received B. S. in Mathematics, M. S. in Mathematics, M. S. in Computer Science, M. Ph. in Computer Science, Ph. D. in Computer Science from University of Belgrade and New York University. From 1983 to 1994 he was in the U.S.A. first as a graduate student and teaching and research assistant at Vanderbilt University in Nashville and Courant Institute of Mathematical Sciences, New York University and later as an Assistant Professor of Electrical Engineering at Cooper Union Graduate School of Engineering, New York. During that time he was the founder and director of Microprocessor Lab and VLSI Lab, leader of scientific projects and supervisor of many theses. From 1994 he was Assistant professor of Computer Science and Director of Computer Center at University of Belgrade, from 2001 Associate Professor, Faculty of Mathematics, and from 2004 also a Professor of Computer Science and Dean of the College of Computer Science, Megatrend University Belgrade. He was teaching more than 20 graduate and undergraduate courses, from VLSI Design and Computer Architecture to Computer Networks, Operating Systems, Image Processing, Calculus and Queuing Theory. His research interest includes mathematical, queuing theory and heuristic optimizations applied to computer networks, image processing and combinatorial problems. He is the author of more than 130 scientific papers and a monograph. He is coeditor or member of the editorial board or scientific committee of number of scientific journals and conferences. Member of the ACM since 1983, IEEE 1984, New York Academy of Sciences 1987, AMS 1995, SIAM 2009. Participated in many WSEAS Conferences with plenary lectures and articles in Proceedings and Transactions.

Plenary Lecture 4

A Possible Solution of Trisection Problem



Professor Siavash H. Sohrab

Robert McCormick School of Engineering and Applied Science
Department of Mechanical Engineering
Northwestern University, Evanston, Illinois
USA

E-mail: s-sohrab@northwestern.edu

Abstract: A solution of the ancient Greek problem of trisection of an arbitrary angle employing only compass and straightedge and its algebraic proof are presented. It is shown that while Wantzel's theory of 1837 concerning irreducibility of the cubic $x^3-3x-1=0$ is correct it does not imply impossibility of trisection of arbitrary angle since rather than a cubic equation the trisection problem is shown to depend on the quadratic equation $y^2-3+c=0$ where c is a constant. The earlier formulation of the problem by Descartes the father of algebraic geometry is also discussed. If one assumes that the ruler and the compass employed in the geometric constructions are in fact Platonic ideal instruments then the trisection solution proposed herein should be exact.

Brief Biography of the Speaker: Siavash H. Sohrab received his PhD in Engineering Physics in 1981 from University of California, San Diego, his MS degree in Mechanical Engineering from San Jose State University in 1975, and his BS degree in Mechanical Engineering from the University of California, Davis in 1973. He then joined Northwestern University in 1982 as postdoctoral research assistant and became Visiting Assistant Professor in 1983, Assistant Professor of Mechanical Engineering in 1984, and since 1990 he is Associate Professor of Mechanical Engineering at the Northwestern University. From 1975-1978 he worked as a scientist doing research on fire protection and turbulent combustion at NASA Ames research center in California. His research interests have been on combustion, fluid dynamics, thermodynamics, and statistical and quantum mechanics.

Plenary Lecture 5

Minimal surfaces and their controlled evolution



Prof. Dr. Constantin Udriste
University Politehnica of Bucharest
Faculty of Applied Sciences
Department of Mathematics-Informatics
Romania
E-mail: udriste@mathem.pub.ro

Abstract: The theory of smallest area surfaces evolving with unit areal speed is a particular case of the theory of surfaces of minimum area subject to various constraints. Based on our recent results, such problems can be solved using the two-time maximum principle in a controlled evolution.

Section 1 studies a controlled dynamics problem (smallest area surface evolving with unit areal speed) via the two-time maximum principle. The evolution PDE is of 2-flow type and the adjoint PDE is of divergence type. Section 2 analyzes the smallest area surfaces evolving with unit areal speed, avoiding an obstacle. Section 3 reconsiders the same problem for touching an obstacle, detailing the results for the cylinder and the sphere.

Brief Biography of the Speaker: Important Career Positions: Professor Consultant, Dean, Director, Chair, Full Professor 1990-2011, University Politehnica of Bucharest, Department of Mathematics-Informatics.

Number of PhD Students: 28 in due time and 19 Doctors in Mathematics.

Membership of Associations: AMS, 1987; Tensor Society, 1985; Balkan Society of Geometers, President, 1994;

Publications: over 45 books; 275 papers; 275 communications..

Plenary Lecture 6

Optimal FIR Estimation of Analog Quantities in Discrete-Time State Space



Professor Yuriy S. Shmaliy

Department of Electronics
DICIS, Guanajuato University
Salamanca, 36855, Mexico

E-mail: shmaliy@salamanca.ugto.mx

Abstract: Measurement is always provided with analog sensors, whereas processing and estimation is typically obtained using DSP power. This lecture examines the problem of optimal filtering, interpolation, and extrapolation of dynamic analog quantities existing in continuous-time with the discrete-time state-space finite impulse response (FIR) structures on an interval of N past measurement points. An important feature of such structures is that the optimal and unbiased estimates converge when N is large, $N \gg 1$, that is typical for highly oversampled quantities. In line with the general theory and estimation algorithms, we discuss the estimation error and error bound (EB) derived via the noise power gain (NPG). We show that the EB specialized via the NPG in the three-sigma sense can also be useful for Kalman filtering. A fast unbiased Kalman-like estimation algorithm ignoring noise and initial errors is discussed in detail. We show that this algorithm is bounded input/bounded output (BIBO) stable and more robust than the Kalman filter against outliers, noise tails, and temporary model uncertainties. Examples of applications are given for the Global Positioning System (GPS)-based measurement of time errors in ovenized crystal clocks that is provided with the fixed horizon estimators, controlled system outputs estimated on full-horizons, and extrapolation of errors in National Time scales. Based upon these and other examples, we show that the Kalman-like FIR estimator is able to outperform the Kalman one if the noise covariances are not known exactly, noise is not white, and both the system and measurement noise components need to be filtered out.

Brief Biography of the Speaker: Dr. Yuriy S. Shmaliy is Full Professor in Electrical Engineering of the University of Guanajuato, Mexico, since 1999. He received the B.S., M.S., and Ph.D. degrees in 1974, 1976 and 1982, respectively, from the Kharkiv Aviation Institute, Ukraine. In 1992 he received the Dr.Sc. degree from the Kharkiv Railroad Institute. In March 1985, he joined the Kharkiv Military University. He serves as Full Professor beginning in 1986 and has a certificate of Professor from the Ukrainian Government in 1993. In 1993, he founded and, by 2001, had been a director-collaborator of the Scientific Center "Sichron" (Kharkiv, Ukraine) working in the field of precise time and frequency. His books *Continuous-Time Signals* (2006) and *Continuous-Time Systems* (2007) were published by Springer, New York. His book *GPS-based Optimal FIR Filtering of Clock Models* (2009) was published by Nova Science Publ., New York. He also edited a book *Probability: Interpretation, Theory and Applications* (Nova Science Publ., New York, 2012) and contributed to several books with invited chapters. Dr. Shmaliy has 286 Journal and Conference papers and 80 patents. He is IEEE Fellow; was rewarded a title, Honorary Radio Engineer of the USSR, in 1991; was listed in *Marquis Who's Who in the World* in 1998; was listed in *Outstanding People of the 20th Century*, Cambridge, England in 1999; and was listed in *The Contemporary Who's Who*, American Bibliographical Institute, 2003. He is currently an Associate Editor for *Recent Patents on Space Technology*. He serves on the Editorial Boards of several International Journals and is a member of the Organizing and Program Committees of various Int. Symposia. His current interests include statistical signal processing, optimal estimation, and stochastic system theory.

Plenary Lecture 7

Specific role and positioning of the telecommunications solution in the Intelligent Transport Systems



Professor Tomas Zelinka
Czech Technical University in Prague,
Faculty of Transportation Sciences,
Czech Republic
E-mail: zelintom@fd.cvut.cz

Abstract: The Intelligent Transport Systems solutions require guaranteed service quality of applied wireless mobile seamless communications solutions with typically widely spread areas coverage. Telecommunications service parameters adopted as performance indicators are tightly linked with ITS service performance quantification. Most of publically provided data services are not able to meet ITS specific requirements on data service quality and security. Nevertheless, ITS requirements can be cost-effectively resolved if the different public and private services are effectively combined. Such solution requires implementation of the relevant flexible system architecture supported by the efficient decision processes. Additionally namely “Car to Infrastructure” and “Car to Car” communication interconnected with the vehicle on board data network based on the CAN (Controlled Area Network) bus can significantly increase potential of the intruders attacks and the integration of the relevant telecommunications security treatment has been understood as the crucial part of the ITS telecommunications solution.

Brief Biography of the Speaker:

Education:

Professor of Informatics at the Czech Technical University (CTU) in Prague,
PhD in Experimental Physics at the Czechoslovak Academy of Sciences,
Master degree in Cybernetics and Computer Sciences at the Czech Technical University in Prague,

Employment:

2005 - Czech Technical University in Prague

Lectures - basic and advanced lectures in area of communications sciences, specific telecommunication solutions for the Intelligent Transport Systems (ITS), telecommunications services management etc.,

R&D - theoretical background of the specific telecommunications solutions dedicated for the ITS, Electronic Fee Collection (EFC) acting as well as the national representative in ISI/CEN, ETC systems Value Added Services (VAS), vehicle On Board Units architecture, ITS and its security requirements etc.

1993 – 2005 Communications business

New products R&D, business development for products like VSAT data services or IP based (VoIP) alternative solution for the global voice communications networking designed for countries of the CEEMEA region, working with EuroTel / Nextel / Global One (i.e. Sprint Int., France Telecom, Deutsche Telekom) etc.,

And simultaneously acting as the external teacher and mentor at the Faculty of transport sciences of the CTU in Prague

1976 – 1993 Geophysical Institute of the Czechoslovak Academy of Sciences

Experimental laboratory and observatory methods in geophysics, studies of the variations and drift of the Earth magnetic field, data communication solutions within international geomagnetic observatory system (INTERMAG), Computer modeling of magnetic material structures with on-line laboratory identification, laboratory study of the magnetic properties of rocks,

1972 – 1976 Industrial R&D

Automatic control systems for the technological processes – CNC (Computer Numerical Control),

Data communications and computer based control in the heavy technological processes,

Published above 120 scientific papers, monographs, books and University textbooks in physics, informatics, ITS, transport telematics and telecommunications.

Plenary Lecture 8

Investigating the Viability of Hybrid and Electric Automobiles by Understanding the Influence of Road Design, Traffic Congestion, and Driver Behavior on Vehicle Power Uses



Professor Manoj K. Jha

Center for Advanced Transportation and Infrastructure Engineering Research
Department of Civil Engineering
Morgan State University
1700 East Cold Spring Lane, Baltimore, MD 21251
USA
E-mail: manoj.jha@morgan.edu

Abstract: The generally upward trend in gasoline prices over the past 10 years has prompted renewed interest in studying the viability of hybrid and electric automobiles in the years ahead. The vehicle power consumption depends on many factors among which the most notable ones are road design characteristics, traffic congestion, and driver behavior. The amount of fuel or battery consumption, which is a measure of vehicle power uses, depends on such factors as vehicle acceleration/deceleration, road configuration, and driver behavior.

In this presentation we formulate vehicle power uses as a function of traffic and road design characteristics, i.e., $V_{pu(i)}=f(V,T,G)$, where V_{pu} is vehicle power uses for the i th vehicle class, V is a vector representing vehicle characteristics, T is a vector representing traffic characteristics, and G is a vector representing geometric characteristics of roadways. Using traffic and roadway data from a congested highway network in the Baltimore area we calculate the vehicle power uses for different vehicle classes, traffic, and road conditions. We then study the power consumption requirements of some hybrid and electric vehicles and relate that to the traffic and roadway characteristics, which will be a key factor in designing future hybrid and electric vehicles. We perform some sensitive analysis to investigate the impact of vehicle, traffic, and geometric characteristics of roadways on vehicle power uses. The preliminary results indicate that older vehicles, higher levels of traffic congestion, and aggressive driving behavior generally require higher vehicle power uses which in turn requires higher fuel and battery consumption. Additional testing will be carried out in future works. This project was funded through the Department of Energy-Massie Chairs of Excellence Program at the Morgan State University.

Brief Biography of the Speaker: Dr. Manoj K. Jha is Professor and Founding Director of the Center for Advanced Transportation and Infrastructure Engineering Research (CATIER) in the department of civil engineering at the Morgan State University, Baltimore, MD, USA. His research interests are in developing computational models for sustainable transportation infrastructure design and route optimization. For his scholastic and research achievements he has received several awards, among which are the 2010 best paper award by the Transportation Research Board (TRB) for the paper entitled "Methodology for Checking Shortcomings in the Three-Dimensional Alignment," presented at the 4th International Symposium on Highway Geometric Design, Valencia, Spain on June 2, 2010; 2008 National Science Foundation (NSF) Small Technology Transfer Research (STTR) award; 2005 and 2006 United Negro College Funds Special Program/Department of Defense (UNCFSP/DoD) Faculty Development Awards; 2005 Department of Homeland Security (DHS) Summer Faculty Research award by the Study of Terrorism and Responses to Terrorism (START) Center of Excellence, University of Maryland, College Park, and 2005 NSF-PASI-TS (National Science Foundation's Pan-American Advanced Study Institute on Transportation Sciences) award by the Rensselaer Polytechnic Institute.

Dr. Jha has authored (or co-authored) more than 120 peer-reviewed articles in journals, books, and conference proceedings in the highway design, infrastructure, optimization, and transportation literature. He has also co-authored 3 books and co-edited 14 books. He is an associate editor of the Open Civil Engineering Journal, and editorial board member of several international journals, including the Journal of Infrastructure Systems, and the International Journal of Operations Research and Information Systems. He has delivered over 20 invited, keynote, and plenary speeches at international conferences and institutions.

Plenary Lecture 9

Non-traditional Approach to Computer Energy Reduction



Professor Vasily G. Moshnyaga

Department of Electronics Engineering and Computer Science
Fukuoka University
8-19-1 Nanakuma, Jonan-ku Fukuoka 814-0180
Japan
E-mail: vasily@fukuoka-u.ac.jp

Abstract: Due to elevating problems of global warming, reduction of energy dissipation becomes increasingly important. According to SMART 2020 report, the number of PCs globally is expected to increase from 592 Million in 2002 to 2 Billion in 2014 and 4 Billion in 2020. Each of these machines consumes energy at every stage of life-cycle: manufacturing, usage and end-of-life. While electrical energy, taken from the wall during the computer usage has been in focus of the design community for over a decade, manufacturing and end-of-life stages have not been considered. A decade ago, PC manufacturing was by 3 times more energy consuming than three year-long PC usage. Since that there have been significant advances in fabrication technology, computer architecture, design, etc. Have these changes affected energy figures? What are the trends? Is manufacturing energy still the main source of energy consumption? Has the usage energy increased? What can be done to reduce total computer energy more efficiently? In this lecture we will try to answer these questions. The goal of this talk is twofold. The first one is to examine trends in energy associated with a typical computer in perspective to advances in technology and computer architecture made over the last decade. The second is to present an approach capable of amortizing the energy increase. We urge to explore energy reduction alternatives beyond the computer usage and advocate computer reuse as a possible approach to save energy.

Brief Biography of the Speaker: Vasily Moshnyaga received the Computer Engineering Degree with Honors from Technical State University, Sevastopol, USSR in 1980 and Ph.D. in computer engineering from Moscow Aviation Institute in 1986. From 1986 to 1992 he was a Senior Lecturer and Associate Professor of Technical University of Moldova, Chisinau, Moldova. From 1991 to 1992 he was a Visiting Scholar at the Department of Electronics and Communication, Kyoto University, Japan. From 1992 to 1998 he was a Lecturer at the Department of Electronics and Communication, Kyoto University, Japan. Since 1998 he has been with the Department of Electronics Engineering and Computer Science, Fukuoka University, Japan, where he is currently a Professor. In 2005-2006 he was a Visiting Professor with the Computer Science Department, UCLA. His current research interests are in the areas of computer architecture, embedded systems, application-specific processors, video processing, VLSI design and design methodologies with a particular emphasis on energy-efficient design techniques. He has authored or co-authored over 170 referred journal and conference publications and holds five patents. Prof. Moshnyaga served as Vice-Chairman of the IEEE CAS Society, Fukuoka Chapter from 2008 to 2010, and an Associate Editor of the IEICE Transactions on Fundamentals of Electronics, Communication and Computer Sciences from 2005 to 2008. He is now a member of IEEE CAS Technical Committee on VLSI and a member of Technical Program Committees of several conferences and symposia including IEEE International Symposium on Circuits and Systems, ACM/IEEE International Symposium on Low-Power Electronics and Design, IEEE International Conference on Systems, Man, and Cybernetics, etc. He received the Nikkei LSI IP Design Award in 2001 and Best Paper Award from SCI'2000/ISAS'2000 in 2000 and Research Encouragement Award from the Embedded Systems Symposium in 2011. He is a member of the Institute of Electronics, Information, and Communication Engineers of Japan and a senior member of IEEE.

Plenary Lecture 10

Combining Virtual and Augmented Reality to Improve the Mechanical Assembly Training Process in Manufacturing



Professor Amaury Andres Peniche Gonzalez

EAFIT University

Colombia

E-mail: apeniche@eafit.edu.co

Abstract: Nowadays, the industrial sector and specially manufacturing companies, have a huge challenge trying to train the workforce while maintaining up to date with the technology, machinery and manufacturing techniques involved in the production process. For that reason this sector claims for effective, in time and quality, training methodologies that do not interrupt or interfere with the continuous workflow of the company or its technological evolution.

Virtual reality offers an alternative that has been successfully implemented in other industries. Virtual reality based training systems have numerous advantages over the conventional methodologies, however, for some applications, virtual reality cannot replace the whole training process because it may be incapable of sufficiently transferring the skills to real world. On the contrary, augmented reality operates in a real environment, providing computer-generated aids to the user in order to “enhance” the real world; therefore, augmented reality based training systems may transfer skills in a greater extent compared to virtual reality. However, augmented reality does not provide all the advantages that virtual reality does, as it makes extensive use of resources like traditional methodologies do. This paper proposes a new methodology that combines virtual and augmented reality; a complete and robust process that fits more complex and demanding training needs of manufacturing companies.

Brief Biography of the Speaker: Amaury Peniche studied Systems Engineering and Production Engineering at EAFIT University in Medellin, Colombia. Since his beginnings in computer science, he has been interested in field of computer graphics and virtual reality, working in the VR Lab in different projects such as surgical training via virtual reality simulators.

The improvement of productive processes has been another topic of his interest, reason why he studied Production Engineering later on. In this field he has conducted several studies, but has focused primarily on applying all his knowledge in computer science and computer graphics to improve productivity in the manufacturing industry, in vital processes like workforce training.

Much of his work is based on the following topics: virtual and augmented reality, immersive systems, user tracking, stereoscopic vision, haptics, 3D Modeling, CAD/CAM Systems and training systems.

Plenary Lecture 11

Create a Self-Modeling DSS in the Cloud: Perspectives, Methodologies and Case Studies



Professor Roberto Revetria

DIPE

University of Genoa

ITALY

E-mail: roberto.revetria@unige.it

Abstract: The raise of BRICs countries has been regarded recently as an opportunity for cost reduction from western companies resulting in a pressure to increase of the delocalization of the production process with the consequence of increasing of the management complexity requiring specific ERP systems able to deal with new and improved process. Every company has business processes in order to manufacture products, to provide services, to purchase goods and even to maintain plants and company's assets; the basic of every change is the knowledge of the process and the understanding the possible evolution. In nowadays systems information systems and cloud infrastructures record events; these events can be used to make processes visible and thus a modeling framework may provide the insights necessary to manage, control, and improve processes. This plenary talk present a survey over the current trend and methodologies applied to provide self modeling capabilities to modern Cloud based ERS. A possible approach and a set of 3 case studies where Computational Intelligence may assist the "self modeling" of complex processes are presented.

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 his 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 researcher, 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), Project management in Master Courses Worldwide and he is teaching Industrial Plants Design in University of Genoa Masters' Courses. He is Professor in Mechanical Engineering and Logistics.

Plenary Lecture 12

A Long-Term Information Service for Professional Development



Professor Lung-Hsing Kuo

Lung-Hsing Kuo

National Kaohsiung Normal University

Taiwan, R.O.C.

E-mail: admi@nknucc.nknu.edu.tw

Abstract: In this presentation, Dr. Kuo would introduce how to design and initiate a long-term information service for professional development in order to fit into the tide of knowledge economy world. Theory, case study and empirical experience would be illustrated. The knowledge economy lead computer service to support information creation, storage, process, transform, transfer, integration, exchange, and applications. All the services are focused on the production and management of structural information in the frame of economic constrains, or to a knowledge-based economy. Professional people are owners of knowledge. Their development are dramatically important is the whole idea. Based upon knowledge engineering, it is possible to support knowledge workers to be more productive. But in the cycle of professional career, personal development and career advancement must be maintained. There is a need to keep professional learning and working record to form the neutral professional portfolio as foundation for reflection, for evaluation, for professional diagnosis, and for professional growing planning and so on and so forth. On the other hand, human resource management should based on well collected and detail information professional development. Historical prospection is the natural of professional growing. Professional knowledge would not be ready in a shot, but required long-term effort. How to establish a durable information system should be considered in human resource development industry.

Brief Biography of the Speaker: Dr. Lung-Hsing Kuo is the Director of the Research Center for Teacher Career Professional Development in National Kaohsiung Normal University. He received his Master in Education (1990~1993) and Ph. D. in Education (1993~1997) from National Kaohsiung Normal University. He specialized in Educational database, Education issues, Information and Society, Humanities and Technologies. And, he is also the COO of Nationwide Teacher In-service Education Information Web, Taiwan, R.O.C. ' <http://inservice.edu.tw> ', Chief editor of Yearbook of Teacher Education Statistics Republic of China (2005-2010) and Chief editor of Yearbook of In-service Teacher Education Statistics Republic of China (2008-2010). He is the author of about 70 papers published in international journals and conference proceedings, and invited book chapters.

Authors Index

Abbas, M. A.	436	Donnici, M.	212	Jo, J. H.	191
Abdella, K.	157	Dozier, K.	234	Jovanovic, R.	417
Alghamdi, A. S.	286	Dzinovic, D.	310	Kako, F.	228
Allahverdi, A.	51	Ebaid, A.	92	Kenaya, R. L.	286
Angelova, A.	251	El-Bakry, H. M.	254	Kim, B.-S.	133
Arcieri, F.	336	Fathabadi, H.	429	Kim, D.	181
Arezina, J.	417	Ferrara, M.	201	Kim, Ja.	181
Aydilek, H.	51	Fudholi, A.	207, 246	Kim, Ji.	133
Bacanin, N.	405	Gaglioti, A. R.	201	Krasic-Kostadinovic, D.	217
Banchuin, R.	240	Gallo, M.	263, 356, 366	Lee, J. M.	60
Bayeh, C. Z.	122, 139, 153	Gandarias, M. L.	187, 363	Lee, S. G.	191
Bayeh, C. Z.	195	Ganea, D.	345	Leu, S.-W.	110
Bianchi, S.	349	Ghalib, I.	436	Lokaj, Z.	315
Brajevic, I.	395	Giribone, P.	271	Lomovoy, V.	423
Bruzon, M. S.	187, 363	Guerra, L.	371	Lord-Attivor, R.	29
Cassettari, L. C.	127, 263, 366	Guizzi, G.	127, 263, 271	Mandic, D.	217, 222, 310
Cassettari, L. C.	371, 382	Guizzi, G.	382	Martinovic, D.	310
Cerda-Villafana, G.	175	Guo, S.-J.	145	Mastorakis, N. E.	122, 139, 153
Cha, S.-H.	377	Hameed, H. A.	254	Mastorakis, N. E.	195, 429
Chang, C.-K.	71	Hameed, S.	436	Mat, S.	207, 246
Chang, D.	234	Hasan, M. A. F. M. R.	305	Mereuta, C.	345
Chang, S.-H.	110	Haw, L. C.	207, 246	Mereuta, E.	345
Chattopadhyay, A.	77	Hibbs, E. G.	54	Mishra, S.	45
Chen, K.-K.	65	Hojjatinia, Z.	98	Misic, I.	411
Chen, S.-W.	65	Honcu, J.	104	Montella, D. R.	366
Chiocca, D.	382	Hyniova, K.	104	Morales-Mendoza, L.	169
Chiu, S. W.	65, 71	Ibarra-Manzano, O.	169, 175	Mosca, R.	127, 371, 382
Chiu, Y.-S. P.	65, 71	Ibrahim, M. Z.	246	Munoz-Minjares, J.	169
Cho, H.-K.	60	Ilyin, V.	423	Murino, T.	271, 371
Clayton, T. G. Jr.	39	Ismail, N. K.	116	Nakabayashi, K.	228
Contreras-Gonzalez, J.	163	Iuliano, A.	382	Nakabayashi, T.	228
D'Iddio, A. C.	336	Jamaludin, N. A. A.	298	Naviglio, G.	371, 382
Danieli, G.	212	Javadi, S.	98	Nikolic, I.	222
De Falco, M.	356	Jerabek, M.	323	Nudo, P.	212
Diaz, C.	292	Jha, M. K.	29, 39, 45	Olivera-Reyna, R.	169

Othman, M. Y.	207, 246	Savarese, S.	133	Testa, A.	263, 271, 366
Pantanella, A.	349	Schunck, C. H.	336	Tin, H.-W.	110
Paramo, G.	292	Sembok, T. M. T.	116	Trefftz, H.	292
Pathak, H. K.	83	Shen, C.-Y.	71	Troncone, E. P.	356
Pavlenko, V.	423	Shimamura, T.	305	Tsai, C.-H.	145
Peniche, A.	292	Shmaliy, Y. S.	163, 169, 175	Tuba, A.	417
Perrelli, M.	212	Smitkova-Janku, L.	104	Tuba, M.	389, 395, 405
Pianese, A.	349	Sohrab, S. H.	277	Tuba, M.	411
Plessky, V.	175	Song, C.	181	Tudoran, M.	345
Ragoub, L.	401	Song, M.-S.	65	Viecelli, P. A.	356
Ramirez-Echeverria, F.	163	Sopian, K.	207, 246	Vilotijevic, N.	222
Raweekul, S.	149	Speransky, V.	423	Vite-Chavez, O.	169
Revetria, R.	127, 263, 271	Stanarevic, N.	405	Welch, T. F.	45
Revetria, R.	366, 371, 382	Stribrsky, A.	104	Zaharim, A.	207, 246
Romano, E.	127, 263, 271	Subotic, M.	411	Zelinka, T.	315, 323
Romano, E.	366, 371	Sug, H.	331		
Ruslan, M. H.	207, 246	Sultan, T.	254		
Sahibuddin, S.	298	Svitek, M.	315, 323		
Sahu, S. A.	77	Talamo, M.	336		
Santillo, L. C.	127, 356	Tashev, T.	251		