



*Institute for Environment, Engineering,  
Economics and Applied Mathematics*

**Editors: Valeri Mladenov, Kleanthis Psarris, Nikos Mastorakis,  
Amauri Caballero, George Vachtsevanos**



# **Development, Energy, Environment, Economics**

**International Conference on  
Development, Energy, Environment, Economics (DEEE '10)**

**Puerto De La Cruz, Tenerife, November 30 - December 2, 2010**

**ISBN: 978-960-474-253-0  
PRINT VERSION ISSN: 1792-6653  
ELECTRONIC VERSION ISSN: 1792-6769**

**Development, Energy, Environment, Economics**



# **DEVELOPMENT, ENERGY, ENVIRONMENT, ECONOMICS**

**International Conference on Development, Energy, Environment,  
Economics (DEEE '10)**

**Puerto De La Cruz, Tenerife  
November 30-December 2, 2010**

# DEVELOPMENT, ENERGY, ENVIRONMENT, ECONOMICS

**International Conference on Development, Energy, Environment,  
Economics (DEEE '10)**

**Puerto De La Cruz, Tenerife, November 30-December 2, 2010**

Published by WSEAS Press

[www.wseas.org](http://www.wseas.org)

**Copyright © 2010, by WSEAS Press**

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.  
See also: <http://www.worldses.org/review/index.html>

ELECTRONIC VERSION:

ISSN: 1792-6769

PRINT VERSION:

ISSN: 1792-6653

ISBN: 978-960-474-253-0



Institute for Environment, Engineering, Economics and Applied Mathematics

# **DEVELOPMENT, ENERGY, ENVIRONMENT, ECONOMICS**

**International Conference on Development, Energy, Environment,  
Economics (DEEE '10)**

**Puerto De La Cruz, Tenerife, November 30-December 2, 2010**



**Editors:**

Prof. Valeri Mladenov, Technical University of Sofia, BULGARIA  
Prof. Kleanthis Psarris, University of Texas at San Antonio, TX, USA  
Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA  
Prof. Amauri Caballero, Florida International University, Miami, FL, USA  
Prof. George Vachtsevanos, Georgia Institute of Technology, Atlanta, GA, USA

**International Program Committee Members:**

Nikos Mastorakis, BULGARIA  
Ronald Yager, USA  
Amauri Caballero, USA  
George Vachtsevanos, USA  
Robert Finkel, USA  
Demetrios Kazakos, USA  
Theodore Trafalis, USA  
Takis Kasparis, USA  
Zhiqiang Gao, USA  
Yan Wu, USA  
Spyros Tragoudas, USA  
Arkady Kholodenko, USA  
Gregory Baker, USA  
Galigekere Dattatreya, USA  
Caroline Sweezy, USA  
Asad Salem, USA  
Dian Zhou, USA  
Metin Demiralp, TURKEY  
Olga Martin, ROMANIA  
Panos Pardalos, USA  
Constantin Udriste, ROMANIA  
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



# Table of Contents

<a href="#"><u>Plenary Lecture 1: Deep insight into the still hidden theory of isoenergetic flow</u></a>	13
<i>Richard Selescu</i>	
<a href="#"><u>Plenary Lecture 2: Neural Network Models for Pattern Recognition in Satellite and Aerial Imagery with Environment and Defense Applications</u></a>	15
<i>Victor-Emil Neagoe</i>	
<a href="#"><u>Plenary Lecture 3: Hand-based Biometrics: High Security vs. Low Security</u></a>	16
<i>Carlos Manuel Travieso Gonzalez</i>	
<a href="#"><u>Plenary Lecture 4: Engineering Application Software: A Formal Primer</u></a>	17
<i>Stefan D. Bruda</i>	
<a href="#"><u>Plenary Lecture 5: Combining mathematical forecasting with intuitive techniques for better decision making</u></a>	18
<i>Raj Siriram</i>	
<a href="#"><u>Plenary Lecture 6: Volatile Organic Compounds in Indoor Environment of Urban India</u></a>	19
<i>Anjali Srivastava</i>	
<a href="#"><u>Plenary Lecture 7: Circuit Analysis to Natural Resources and Environmental Economic Dynamics and Control</u></a>	20
<i>Andre A. Keller</i>	
<a href="#"><u>Plenary Lecture 8: The advance experimental and numerical studies of water turbulent jets</u></a>	21
<i>Dan Victor Cavaropol</i>	
<a href="#"><u>Plenary Lecture 9: The importance of results dissemination within multinational environmental projects. Case study: Project CIVITAS – SUCCESS</u></a>	22
<i>Catalin Popescu</i>	
<a href="#"><u>Plenary Lecture 10: Achieving the Best Practices in Lightning Protection System</u></a>	23
<i>Mohd Zainal Abidin Ab Kadir</i>	
<a href="#"><u>Plenary Lecture 11: Controlled stochastic jump processes</u></a>	24
<i>A. B. Piunovskiy</i>	
<a href="#"><u>Plenary Lecture 12: Resonant Absorption of Long Waves By Linear Microstructures</u></a>	25
<i>Vladimir V. Arabadzhi</i>	
<a href="#"><u>Plenary Lecture 13: Building Awareness and Understanding of Electrical Ecosystems as Confluence of Human Technical Applications and Earth Natural Systems</u></a>	26
<i>Cornelia Aida Bulucea</i>	
<a href="#"><u>Plenary Lecture 14: Strategic Alternatives for the Transport Sector and Fuel Consumption in Brazil</u></a>	27
<i>Hugo Ferreira Braga Tadeu</i>	
<a href="#"><u>Plenary Lecture 15: The Adoption of eBanking: an Application of Theories and Models for Technologies Acceptance</u></a>	28
<i>Liliana Mihaela Moga</i>	



<a href="#"><u>Plenary Lecture 16: Environment Monitoring Based on Sensor Networks and Artificial Intelligence</u></a>	29
<i>Constantin Volosencu</i>	
<a href="#"><u>Plenary Lecture 17: Current Measurement Trends in Financial Reporting: From Historical Costs towards Fair Value Concept (and Back?)</u></a>	30
<i>Jiri Strouhal</i>	
<a href="#"><u>Plenary Lecture 18: Relation between Organizational Culture and Work Motivation in a Romanian State University</u></a>	31
<i>Cucu-Ciuhan Geanina</i>	
<a href="#"><u>Implementation of Natura 2000 Network in Romania</u></a>	33
<i>Cristian Mares, Constanta Matulescu, Claudia Gilia</i>	
<a href="#"><u>The Use of Balanced Scorecard for a Sustainable Deployment of Renewable Energy Sources in the Czech Republic</u></a>	37
<i>Ticiano Costa Jordao, Michaela Striteska, Karel Satera</i>	
<a href="#"><u>Enhanced PID Controllers in Combustion Control</u></a>	44
<i>Bohumil Sulc, Cyril Oswald</i>	
<a href="#"><u>Natural Factors that Can Affect Wind Parks and Possible Implementation Solutions in a Geographic Information System</u></a>	50
<i>Adela Bara, Anda Velicanu, Ion Lungu, Iuliana Botha</i>	
<a href="#"><u>Decision Support Systems - Solutions for Predicting, Monitoring and Integrating Wind Energy Resources into the National Grid Companies</u></a>	55
<i>Adela Bara, Simona Oprea, Anda Velicanu, Vlad Diaconita</i>	
<a href="#"><u>Luminary Scheme Improvement using Suitable Category and Space to Height index for Point Light Sources</u></a>	61
<i>Hengameh Kojooyan Jafari</i>	
<a href="#"><u>Voltage Control of DFIG for Maximum Turbine power Tracking</u></a>	66
<i>Ahmad Radan, Hengameh Kojooyan Jafari</i>	
<a href="#"><u>Improvement of Space to Height Index for Surface Circular Light Sources</u></a>	71
<i>Hengameh Kojooyan Jafari</i>	
<a href="#"><u>A Strain Gauge Based Torque Transducer (Sensor) for Measuring Dynamical Load In-Rotation</u></a>	75
<i>M. Hilal Muftah, S. M. Haris</i>	
<a href="#"><u>Environmental Monitoring Based on Sensor Networks and Artificial Intelligence</u></a>	79
<i>Constantin Volosencu</i>	
<a href="#"><u>Vector Time Series Identification Methodology Based on Wireless Sensor Networks</u></a>	84
<i>Daniel Ioan Curiac, Constantin Volosencu</i>	
<a href="#"><u>Cellular Automata Based Simulation for Smoke and Fire Spreading in Large Buildings</u></a>	89
<i>Daniel Ioan Curiac, Ovidiu Baniias, Constantin Volosencu, Dan Pescaru</i>	

<a href="#"><u><b>Audit Specifics for SME Businesses in Czech Republic</b></u></a>	95
<i>Libuse Mullerova, Marie Pasekova, Jiri Strouhal</i>	
<a href="#"><u><b>Is EBIT the Right Performance Measure for a Private Czech Company?</b></u></a>	100
<i>Bohuslava Knapova, Tomas Krabec, Jaroslava Roubickova</i>	
<a href="#"><u><b>Barriers of Cross-Border Merger with a Company Located in the Czech Republic</b></u></a>	106
<i>R. Sklenar</i>	
<a href="#"><u><b>Family Indebtedness and Government Indebtedness as Siamese Twins in the Modern World</b></u></a>	112
<i>Lubos Smrcka</i>	
<a href="#"><u><b>Identification of Several Factors Affecting Biodegradation of Aromatic-Aliphatic Copolyester</b></u></a>	118
<i>Petr Stloukal, Jiri Jandak, Lucie Husarova, Marek Koutny, Sophie Commereuc, Vincent Verney</i>	
<a href="#"><u><b>Preparation of Submicroparticles based on Biodegradable Co-Polyester</b></u></a>	122
<i>Petr Stloukal, Vladimir Sedlarik, Lucie Husarova, Vera Kasparkova, Marek Koutny</i>	
<a href="#"><u><b>Removal of Mercury (II) from Aqueous Phase Using Ceramic</b></u></a>	128
<i>Jatindra N. Bhakta, Yukihiro Munekage</i>	
<a href="#"><u><b>Circuit Analysis to Environmental Economic Dynamics and Control</b></u></a>	133
<i>Andre A. Keller</i>	
<a href="#"><u><b>The Toxicity and Management of Benzene Emissions from the Tank Park of a Refinery</b></u></a>	142
<i>Liviu Toader, Florinel Lupu, Catalin Popescu</i>	
<a href="#"><u><b>Amalgam Electrodes as Tool for Study of Environmental Important Compounds and for Detection of DNA Damages</b></u></a>	146
<i>Bogdan Yosypchuk, Miroslav Fojta, Jiri Barek</i>	
<a href="#"><u><b>Cluster Concept Development – A Case Study from Poland</b></u></a>	151
<i>M. Bialic-Davendra, D. Pavelkova</i>	
<a href="#"><u><b>Use of Temperature Gradient Gel Electrophoresis for the Investigation of Poly(Vinyl Alcohol) Biodegradation</b></u></a>	157
<i>L. Husarova, J. Ruzicka, H. Marusincova, M. Koutny</i>	
<a href="#"><u><b>Modeling of Regional and Interregional Relations</b></u></a>	160
<i>Bohuslav Sekerka, Robert Bata</i>	
<a href="#"><u><b>The Importance of Results Dissemination within Multinational Projects Case Study: Project Civitas – Success</b></u></a>	177
<i>Catalin Popescu, Augustin Mitu, Daniela Uta</i>	
<a href="#"><u><b>The Advance Experimental and Numerical Studies of Water Turbulent Jets</b></u></a>	182
<i>Dan Victor Cavaropol</i>	
<a href="#"><u><b>The Electrochemical Assessment of Cadmium and Lead Mobility in the Rhizosphere</b></u></a>	186
<i>Ivana Sestakova, Jana Jaklova Dyrtova, Michal Jakl, Tomas Navratil</i>	
<a href="#"><u><b>Supported Phospholipid Bilayers and Transport of Heavy Metals Across them</b></u></a>	192
<i>Tomas Navratil, Ivana Sestakova, Vladimir Marecek</i>	

<a href="#"><u>Moisture Transfer Phenomena in Porous Materials. Numerical Modeling</u></a>	198
<i>Andreea Vartires, Cristiana Croitoru, Dan Victor Cavaropol, Manuel Serban</i>	
<a href="#"><u>Numerical Simulation of Temperature Evolution Resulting from a Fire in a Road Tunnel</u></a>	203
<i>Irina Zgavarogea, Liviu-Valentin Balanescu, Dan Victor Cavaropol</i>	
<a href="#"><u>Flow Modeling of the Fire Extinguishing Liquids Inside the Fire Hoses</u></a>	207
<i>Manuel Serban, Ionel Alin Mocioi, Dan-Victor Cavaropol</i>	
<a href="#"><u>Optimizing the Construction Elements of Underground Parking through Temperature Distribution Analysis in Fire Situations</u></a>	212
<i>Dan V. Cavaropol, Dragos Rosu, Dan Diaconu-Sotropa, Lucian Burlacu</i>	
<a href="#"><u>Health Risk Assessment of Air Pollution Caused by Polycyclic Aromatic Hydrocarbons Bound to Particulate Matter Smaller than 1 <math>\mu\text{m}</math></u></a>	218
<i>A. Bumbova, V. Adamec, J. Navratil, L. Jesonkova, A. Langerova</i>	
<a href="#"><u>Wet Preconcentration Techniques for "Real Time" Determination of Gaseous Pollutants in Ambient Air</u></a>	224
<i>Z. Vecera, P. Mikuska, J. Kellner, J. Navratil</i>	
<a href="#"><u>Switched Reluctance Generator (SRG) for Wind Energy Applications</u></a>	230
<i>Eleonora Darie, Emanuel Darie, Dan Cavaropol</i>	
<a href="#"><u>Regional Development Partnership under Innovation and Learning Processes</u></a>	234
<i>Romeo V. Ionescu, Liliana M. Moga</i>	
<a href="#"><u>Sustainability of Public Debt in Croatia</u></a>	241
<i>Jurica Simurina, Dario Turkalj</i>	
<a href="#"><u>Disinfection of Drinking Water and Noncarcinogenic Risks</u></a>	245
<i>F. Bozek, M. Bozek, J. Dvorak, A. Bumbova, J. Navratil, M. Caslavsky</i>	
<a href="#"><u>Regional Competitiveness and Romanian Tourism in the European Context</u></a>	251
<i>Mihaela Neculita, Daniela Ancuta Sarpe, Vasile Mazilescu, Irina Susanu</i>	
<a href="#"><u>The Adoption of E-Banking: An Application of Theories and Models for Technologies Acceptance</u></a>	255
<i>Liliana M. Moga</i>	
<a href="#"><u>Energy Systems for Modern Buildings – Simulation of Operating States of Heat Pumps</u></a>	260
<i>Petr Mastny, Zuzana Mastna, Lukas Radil</i>	
<a href="#"><u>Analysis of Small Business Entities According to Tax Treatment in Croatia</u></a>	268
<i>Natasa Kurnoga Zivadinovic, Nika Sokol, Ivana Kukuruzovic</i>	
<a href="#"><u>Romania's Fishing Policy Competitiveness in European Integration Context</u></a>	272
<i>Mihaela Neculita, Daniela A. Sarpe, Constantin Afanase, Valentin Neculita</i>	
<a href="#"><u>Essay on Efficient Implementation of Integrated Risk Management System (IRM)</u></a>	276
<i>Aziz Soulhi, Driss Benesrighe, Anouar Hasbaoui, Youssef Saida</i>	
<a href="#"><u>Comparison of Often Applied Methods for Industrial Cluster Identification</u></a>	282
<i>Jan Stejskal</i>	

<b><u>Environmental and Health Risks Associated with Biomedical Waste Management</u></b>	287
<i>Nikos E. Mastorakis, Carmen A. Bulucea, Tatiana A. Oprea, Cornelia A Bulucea, Philippe Dondon</i>	
<b><u>Evaluation of Carbon Sequestration Potential in Undisturbed Mangrove Forest in Terminos Lagoon, Campeche</u></b>	295
<i>J. G. Ceron-Breton, R. M. Ceron-Breton, M. Rangel-Marron, A. Estrella-Cahuich</i>	
<b><u>Monitoring of Nitrate Content in Local Sources of Drinking Water in Eastern Bohemia</u></b>	301
<i>Jaromira Chylkova, Ilona Obrsalova, Renata Selesovska, Tomas Brunclik, Ticiano Costa Jordao</i>	
<b><u>Tools for Environmental Safety Ensuring and their Utilization by Enterprises in the Czech Republic</u></b>	305
<i>R. Myskova, R. Roudny, M. Hub, J. Capek</i>	
<b><u>Models for Determining Taxes on Pollution – A Major Goal for Environmental Purposes</u></b>	310
<i>M. Bulearca, Marina Badileanu, C. Popescu, M. S. Muscalu</i>	
<b><u>Special Features of Models for Natural Resources Approach</u></b>	316
<i>M. Bulearca, C. Popescu, C. Sima, Cornelia Neagu</i>	
<b><u>Usage of Business Process Tools for Modeling Requirements on System Changes</u></b>	321
<i>Stanislava Simonova, Iva Zavadilova</i>	
<b><u>Does Air Pollution Affect the Price of Housing? A Joint Geostatistics and Spatial Econometric Perspective</u></b>	327
<i>R. Minguez, G. Fernandez-Aviles, J. M. Montero</i>	
<b><u>Spatio-Temporal Modeling of Carbon Monoxide. Are Ecologists Right?</u></b>	333
<i>G. Fernandez-Aviles, J. M. Montero, J. Mateu</i>	
<b><u>Estimating the Asymmetric Pattern of Volatility in China Stock Markets. A New Proposal</u></b>	338
<i>M. C. Garcia, G. Fernandez-Aviles, J. M. Montero</i>	
<b><u>Reduced Power Consumption in Atmosphere Detritiation System (ADS) for Sustainable Development</u></b>	343
<i>Sorin Gherghinescu, Gheorghe Popescu</i>	
<b><u>Portfolio VaR for SNP Distributions</u></b>	347
<i>Javier Perote</i>	
<b><u>Foreign Direct Investment, Employment Creation and Economic Growth in CEE Countries. An Open Issue</u></b>	352
<i>Cristina Jude, Monica Ioana Pop Silaghi</i>	
<b><u>Career Counselling Needs in a Self Employment Era</u></b>	357
<i>Daniela Ancuta Sarpe, Mioara Chirita, Simona Toma</i>	
<b><u>Analysis of Quality of Life for People with Disabilities</u></b>	363
<i>Pavel Jirava, Jiri Krupka, Miloslava Kasparova, Jan Mandys</i>	
<b><u>Barrier Structures using Shape Memory Alloy Springs</u></b>	367
<i>Sonia Degeratu, Nicu Bizdoaca, Sabin Rizescu, Petre Rotaru, Vasile Degeratu, Gabriela Tont</i>	
<b><u>Utilization of Hybrid Local Search Algorithm for Parallel Computing</u></b>	373
<i>Jan Panus</i>	

<b><u>Testing the Efficiency of the Romanian Stock Market</u></b>	378
<i>Darie Moldovan</i>	
<b><u>Using Value at Risk Models for Decision Fundamentation on Central and Eastern Europe Stock Markets</u></b>	382
<i>Simona Mutu, Peter Balogh, Darie Moldovan</i>	
<b><u>Ecological Aspects of Small-Scale Biomass Combustion Control</u></b>	388
<i>Jan Hrdlicka, Bohumil Sulc, Stanislav Vrana, Viktor Placek</i>	
<b><u>The Analysis of the Financing Sources for the Romanian Companies Listed at Bucharest Stock Market</u></b>	394
<i>Adriana Danis, Luminita Parv</i>	
<b><u>External Capital Investments in Contemporary Times</u></b>	399
<i>Adriana Danis, Luminita Parv</i>	
<b><u>The Use of Reed Briquettes in a Domestic Heat</u></b>	403
<i>Gina-Georgiana Rolea, Gheorghe Ciocea, Ion V. Ion, Florin Popescu</i>	
<b><u>Authors Index</u></b>	407

## Plenary Lecture 1

### Deep insight into the still hidden theory of isoenergetic flow



**Prof. Richard Selescu**

Department of Aerodynamics,

“Elie Carafoli” National Institute for Aerospace Research – INCAS  
220, Bd. Iuliu Maniu, Code 061126, Sector 6, Bucharest, ROMANIA

Phone: +40 21 434 0083; Fax: +40 21 434 0082;

rselescu@aero.incas.ro web page: <http://www.incas.ro>

**Abstract:** The Aim of the Work: This intrinsic analytic study was done with the aim of improving and enriching the knowledge about the local physical phenomena encountered in both fluid mechanics and magneto-fluid dynamics, elaborating a new physical & mathematical model of fluid flow and magnetic field, by using a special type of coordinate system. It continues a series of works presented by the author at the 5th WCNA and at some WSEAS conferences in 2008, representing a real deep insight into the still hidden theory of isoenergetic flow, this one being a lesser known domain in the physical sciences (approaching some new special topics in classical potential theory, fluid mechanics, aerothermodynamics and magneto-hydrodynamics, including plasma). So far, to the best of the author's knowledge, nowhere in the world literature a method to obtain the general case of first integrability for the vector equations of motion has been considered, but very particular cases only. These include the vector equation of motion in the steady and unsteady inviscid (or viscous) fluid mechanics (D. Bernoulli and D. Bernoulli-Lagrange integrals), the vector equation of motion and the “magnetic induction” one in magneto-hydrodynamics, as well as the system of these two simultaneous vector equations in magneto-hydrodynamics. As its title shows, this work is fully original.

**Key-Words and Phrases:** rotational flows, steady and unsteady flows, virtual “isentropic” (Bernoulli's) surfaces, inviscid and viscous fluids, compressible fluids, flow of an electroconducting fluid in an external magnetic field; Selescu's vectors, space curves (vector lines) and virtual “zero-work” surfaces

**2000 Mathematics Subject Classification:** 31 Potential theory; 70 Mechanics of particles and systems; 76 Fluid mechanics; 78 Optics, electromagnetic theory; 80 Classical thermodynamics, heat transfer

**Extended Abstract:** A model of the isoenergetic flow of an inviscid fluid was introduced, in order to establish a simpler form for the general PDE of the velocity potential. It consists mainly in using an intrinsic system of triorthogonal curvilinear coordinates (one of them being tied to the local specific entropy value). The choice of this system enables the treatment of any 3-D flow (rotational, steady and unsteady) as a potential 2-D one, introducing a 2-D velocity “quasi-potential”, specific to any isentropic surface. The dependence of the specific entropy on this velocity “quasi-potential” was also established. On the above surfaces the streamlines are orthogonal paths of a family of lines of equal velocity “quasi-potential”. This model can be extended to some special (but usual) cases in magneto-plasma dynamics (taking into account the flow vorticity effects, as well as those of the Joule–Lenz heat losses), considering a non-isentropic flow of an inviscid electroconducting fluid in an external magnetic field. There always are some space curves along which the motion equation admits a first integral, making evident a new physical quantity – Selescu's magneto-hydrodynamic vector  $\$$ . For a fluid with an infinite electric conductivity (like highly ionized plasma), these curves are the flow isentropic lines, also enabling the treatment of any 3-D flow as a “quasi-potential” 2-D one. The model was extended to the viscous Newtonian fluid flows and to visco-magnetic flows of conducting fluids respectively, introducing some “zero-work” (for the non-conservative terms) surfaces, some new physical quantities – Selescu's vectors (roto-viscous  $S$ ,  $S_i$ , roto-visco-magnetic  $\$$ , and magnetic  $S_m$ ), new intrinsic coordinate systems, and a 2-D magnetic “quasi-potential”, searching for and finding first integrals for the motion equation in viscous fluid mechanics and in MHD, and for the equation of magnetic induction (separately treated), the last one in a similar way to the vortex equation for a viscous Newtonian incompressible fluid. The new model was analyzed in order to find a case of first integrability in MHD for the system of motion and magnetic induction simultaneous equations, establishing a special procedure for finding such first integrals. In almost all cases treated, the newly found first integrals are similar to D. Bernoulli and D. Bernoulli–Lagrange ones, being obtained by a procedure for eliminating the non-conservative terms in the respective equations. The PDE of the velocity potential, that of the isentropic surfaces, as well as those of Selescu's vector lines and zero-work surfaces, were also given.

**Brief Biography of the Speaker:**

Dr. Richard Selescu graduated as an engineer from the Polytechnic Institute Bucharest, the Faculty of Mechanics, Department of Aircraft Engineering in 1970. He is working in the National Institute for Aerospace Research "Elie Carafoli" – INCAS, Department of Aerodynamics, at the Trisonic Wind Tunnel Laboratory. He received his PhD degree in Aerodynamics and Fluid Mechanics at the Aerospace Engineering Faculty of the "Politehnica" University Bucharest in 1999. Among the research fields of interest, he approached the analytic modeling in aerodynamics, fluid mechanics and magnetofluid dynamics. Thus, he introduced the following nomenclature: the isentropic surfaces and a 2-D velocity quasi-potential function on these surfaces (in fluid mechanics); the zero-work surfaces for the non-conservative terms in the motion equation (in viscous fluid mechanics and magnetofluid dynamics); some new physical quantities – the roto-viscous vector (in Newtonian viscous fluid mechanics), the incompressible roto-viscous vector (in viscous incompressible fluid mechanics, for the vortex equation), the magneto-hydrodynamic vector (in inviscid magnetofluid dynamics), the roto-visco-magnetic vector (in viscous magnetofluid dynamics) and the magnetic vector (in visco-magnetic magnetofluid dynamics, for the equation of magnetic induction); a new shock-free axisymmetric supersonic flow – the tronconical flow (in supersonic aerogasdynamics); the similarity depth for satisfying the gas-hydrodynamic analogy (in supercritical hydrodynamics).

## Plenary Lecture 2

### Neural Network Models for Pattern Recognition in Satellite and Aerial Imagery with Environment and Defense Applications



**Professor Victor-Emil Neagoe**  
Polytechnic University of Bucharest,  
ROMANIA  
victoremil@gmail.com  
Tel. 0040 721 23 50 20

**Abstract:** This lecture is an approach dedicated to the improvement and experimentation of several neural network pattern recognition models for satellite and aerial imagery. One considers the following neural network classifiers: Multilevel Perceptron (MLP), Radial Basis Function (RBF) neural net, supervised Self-Organizing Map (SOM), and the system of Concurrent Self-Organizing Maps (CSOM). CSOM was previously proposed by the author of this lecture; it is in fact a model of Concurrent Neural Classifiers (CNC), representing a collection of small neural networks, which use a global winner-takes-all strategy. Each neural module is trained to correctly classify the patterns of one class only and the number of modules equals the number "M" of classes. One considers the case of choosing the SOM (Self-Organized-Map) as a neural module. We built "M" training pattern sets and each neural module is trained with the pattern set characterized by the corresponding class label. We have implemented and evaluated the above mentioned neural classifier models for two kind of applications. First application investigates multispectral satellite image classification for environment monitoring. The implemented neural classifiers are evaluated using a LANDSAT 7 ETM+ image. One takes in consideration both the interband and also the intraband pixel correlation of the 7-band image. There is a subset containing labeled pixels, corresponding to several thematic categories: urban areas, agricultural fields, woods, water, bushes, meadows and barren fields. The best experimental result is obtained by CSOM model and it corresponds to the recognition rate of 99.11%. Second application evaluates the considered neural network models for Automated Target Recognition (ATR) based on spot Synthetic Aperture Radar (SAR) imagery. One uses the MSTAR (Moving and Stationary Target Acquisition and Recognition) database for three categories of military vehicles: BMP2 (Tank), BTR 70 (Armored car) and T72 (tank). The best performance corresponds also to the CSOM model and it leads to the recognition rate of 95.81%.

#### **Brief Biography of the Speaker:**

Dr. Victor-Emil Neagoe is a Professor of the Department of Electronics, Telecommunications, and Information Technology at the Polytechnic University of Bucharest, Romania. He teaches the following courses: Pattern Recognition and Artificial Intelligence; Digital Signal Processing; Computational Intelligence; Detection and Estimation for Information Processing. He co-ordinates 10 Ph.D. candidates. His research interest corresponds to the fields of pattern recognition, computational intelligence, biometric technology, satellite image analysis and sampling theory. Prof. Neagoe is author of more than 120 published papers. He has internationally recognized results concerning concurrent self-organized maps, face recognition, satellite image analysis, optimum color conversion, syntactical self-organized maps, nonuniform sampling theorems, inversion of the Van der Monde matrix, predictive ordering and linear approximation for image data compression, Legendre descriptors.

He has been included in Who's Who in the World and Europe 500 and he has been nominated by the American Biographical Institute for American Medal of Honor and for World Medal of Honor. He has been a Member IEEE since 1978 and a Senior Member IEEE since 1984. He has been a plenary speaker for several WSEAS conferences since 2006 till 2009.



## Plenary Lecture 3

### Hand-based Biometrics: High Security vs. Low Security



#### Professor Carlos Manuel Travieso Gonzalez

Vice-Dean

University of Las Palmas de Gran Canaria  
Technological Centre for Innovation in Communications (CeTIC)  
Higher Technical School of Telecommunications Engineering  
Campus Universitario de Tafira, s/n  
Pabellon B - Despacho 111  
35017 - Las Palmas de Gran Canaria, SPAIN.  
Phone: +34928452864 / Fax: +34928451243  
ctravieso@dsc.ulpgc.es

**Abstract:** In this Plenary Lecture, will be comment the some biometric approaches and its real possibility for its use on high and low security applications. The advances of multimodal biometric systems and the new biometric system allow its use in different scenarios. The unions of technology and the biometric business have increased its expansion. The use of biometric recognition systems has yielded significant progress in the last years. However, considerable advances on both system precision and cost reduction of sensors, has not produced an increase in user's confidence, mainly due to lack of reliability in real operational environments, and also due to privacy and vulnerability concerns. In order to alleviate the problems generated by the adoption of biometric systems, which are in any case highly valuable for industrials, the innovative development of a biometric scheme is proposed; operating in realistic environments, the system will incorporate the following features:

1. Multibiometric, incorporating three different perspectives: multimodal, multi-shot and multi-level.
2. High transparency and acceptability, and low intrusiveness of the adopted intra-modalities on hand-based biometrics, as far as users accept them as being highly transparent, and do not require user cooperativeness, nor show social refusal, as iris or fingerprints do.
3. Combined use of these intra-modalities in order to attain reliability comparable to iris or fingerprint modalities.
4. Use of objective quality measures of the test sample, in order to weight the multibiometric fusion process, inducing so an improvement in the authentication rates.
5. Hardware and software development oriented to conduct match-on-card tests, in order to improve privacy and protection to vulnerability features.
6. Unsupervised database acquisition of the referred biometric traits, producing data availability close to operational conditions in real environments.
7. Removal of technological dependencies by means of free-code availability.

#### Brief Biography of the Speaker:

Dr. Carlos M. Travieso-Gonzalez was born in Spain. He received the M.Sc. degree in 1997 in Telecommunication Engineering at Polytechnic University of Catalonia (UPC), Spain. Besides, he received Ph.D. degree in 2002 at University of Las Palmas de Gran Canaria (ULPGC-Spain). He is an Associate Professor from 2001 in ULPGC, teaching subjects on signal processing and learning theory. His research lines are biometric systems, classification system, medical signal processing, environmental intelligence, and data mining. He has researched in 23 International and Spanish Research Projects, some of them as head researcher. He has 150 papers published in international journals and conferences. He has been reviewer in different international journals and conferences since 2001. He is Image Processing Technical IASTED Committee Member. He is Vice-Dean from 2004 in Higher Technical School of Telecommunication Engineers in ULPGC.

## Plenary Lecture 4

### Engineering Application Software: A Formal Primer



#### **Stefan D. Bruda, PhD**

Associate Professor of Computer Science

Bishop's University 2600 College St, Sherbrooke, Quebec J1M 1Z7,  
CANADA

Phone: (819) 822-9600 x2374, Fax: (819) 822-9661

<http://bruda.ca>

[stefan@bruda.ca](mailto:stefan@bruda.ca)

**Abstract:** Formal methods--be they logical (such as model checking) or algebraic (such as model-based testing)--have established themselves as mainstream tools for verification and validation. Hardware, device drivers, and network protocol have all been formally validated in various contexts. Recent Turing prizes have recognized this success. When it comes to specifying and verifying complex application software, formal methods have hit however a stumbling block. Indeed, conformance testing is traditionally based on finite-state formalisms: a system is at any time in one of the multitude of named states. Such an approach fails for complex software because of the sheer number of necessarily distinct states (already happening in simpler systems, but becoming simply unmanageable for complex applications such as word processors or operating systems). Bringing conformance testing to complex application software is an emerging area. Typical programming languages (and thus the control flow of software programmed using them) feature nested, recursive invocations of program modules. These features are modelled naturally by context-free languages. Many non-regular properties are therefore required for software verification. Such properties generate an finite state space, which cannot be handled by finite-state process algebrae or by standard verification techniques such as model checking. Context-free process algebrae such as BPA can specify context-free properties. However, concurrency cannot be provided by context-free process algebrae since context-free languages are not closed under intersection. This talk focuses on the quest of finding a formalism that is expressive enough to model the context-free phenomenae from complex software yet allows for a compositional approach to conformance testing. We start with visibly pushdown languages (VPL), a promising construct which unfortunately is not suitable for compositional specification and verification. We extend VPL to multiple stacks, obtaining multi-stack visibly pushdown languages (MVPL). These languages model concurrency naturally, but their standard definition does not allow compositional approaches. We then present an alternate set of operations over MVPL that are natural and also permit compositional specification and verification. The subsequent tools for specifying complex, recursive application software will also be discussed.

#### **Brief Biography of the Speaker:**

Dr. Stefan D. Bruda is Associate Professor of Computer Science with Bishop's University in Sherbrooke, Quebec. He obtained his PhD from Queen's University at Kingston for his work in the area of computational models for parallel and real-time computations. His current research interests remains mostly in the theoretical realm, though they are now closer to practice being focused primarily on formal software engineering (but also on models of computation and formal languages). Dr. Bruda is the author of the book "Reconfiguration is Shared Memory: Collapsing the Hierarchy of Parallel Models with Reconfigurable Buses and Shared Memory" (LAP Publishing, 2010) and over 40 journal and conference papers. He is an editor of Parallel Processing Letters.  
<http://bruda.ca/> <http://part.bruda.ca/papers.html>

## Plenary Lecture 5

### Combining mathematical forecasting with intuitive techniques for better decision making



**Dr Raj Siriram**

Chief Information Officer

Centre for Business Innovation and Technology Solutions - (C-Bits)

Dimension Data Middle East and Africa

SOUTH AFRICA

Tel: 087 365 6702 or +2711 575 6702

Fax: +11 576 6702

Mobile: +2782 894 6253

[raj.sriram@mea.dimensiondata.com](mailto:raj.sriram@mea.dimensiondata.com)

**Abstract:** Mathematical models are used to forecast new product sales. Forecasting using mathematical methods have been criticized by many researchers, as the forecasts are often not sufficiently accurate to be applied to business decisions. Forecasting new product sales may be improved by using intuitive techniques. In this paper intuitive techniques are applied to mathematical forecasting models. A growth curve predication model is developed; in addition a reference data set is used to validate the outputs, providing important lessons for managers.

**Brief Biography of the Speaker:**

Dr. Raj Siriram is Chief Information Officer at Dimension Data Middle East and Africa. He has a wide range of industrial experience from Information technology, profit and loss responsibilities in high technology environments, supply chain management, project management, performance management and business engineering. His research interests are in technology management and systems engineering. Raj is a registered Professional Technologist in engineering. He holds a Ph.D. in Industrial Engineering from the University of Witwatersrand, In South Africa, School of Mechanical, Industrial and Aeronautical Engineering. He is also a member of the institute of Directors, South African Institute of Industrial Engineers, Institute of Industrial Engineers (US) and many other professional bodies.

## Plenary Lecture 6

### Volatile Organic Compounds in Indoor Environment of Urban India



**Dr. Anjali Srivastava**  
Deputy Director & Head  
Kolkata Zonal Center  
East Kolkata Development Project  
i-8 Sector C, EM Bye Pass  
PO East Kolkata Township  
Kolkata 700107  
INDIA  
anjali54@gmail.com

**Abstract:** Indoor Air Pollution (IAP) describes the adverse ambient air conditions inside households, schools, places of work and other indoor spaces. This can be caused by a range of sources, including stoves, smoking, consumer products, furnishings, infiltration of outdoor air and machinery etc. Air pollution has become a major concern in India in recent years both because it is now clear that large parts of the Indian urban population are exposed to some of the highest pollutant levels in the world and also because new studies around the world on the health effects of air pollution have increased confidence in estimates of the risks posed by air pollution exposures. Most IAP issues studied in the developing world including India focus on combustion of coal, wood and other biomass fuels. Pollutants focused are mainly PM10 and PM 2.5. Very little work has been done on monitoring of VOCs in indoor of Indian urban cities. Limited studies carried out indicate high levels of VOCs in indoors. Sufficient data is available to categorise VOCs as a pollutant warranting control in indoor environment.

More than forty VOCs have been identified in variety of indoor environment viz residential, food court, theater, conference hall, library, offices, restaurant, bar, class rooms, bank and printing press in Mumbai and Kolkata. One fourth of these are Hazardous Air Pollutants. The exposure risk and Hazard Index has been estimated to be greater than 1.

#### **Brief Biography of the Speaker:**

Dr. Anjali Srivastava is presently working as Deputy Director and Head at National Environmental Engineering Research Institute (NEERI), Kolkata Zonal Centre. She is working with the Institute for last 20 years. She is M.Sc. (Master of Science, 1974) and Ph.D. in Physical Chemistry (1979) from Nagpur University, India and was associated with Nagpur University, Allahabad University and Kobe University, Japan (1980-81) as faculty. She has more than 120 publications in journals of repute. She is author chapters in books. She has represented NEERI in number of regulatory committees. Her key qualifications are air and water pollution monitoring and modelling, Development of analytical methods for air and water pollution monitoring and instrumentation development, Environmental Impact Assessment and Audit. She is reviewer of scientific articles for Atmospheric Environment, The Science of Total Environment, Environment Monitoring and Assessment, Environment Modelling and Assessment, Journal Hazardous Material and others. The Zonal Center caters to the R&D needs related to environment and development of Eastern and North Eastern region of India.

## Plenary Lecture 7

### Circuit Analysis to Natural Resources and Environmental Economic Dynamics and Control



#### Professor Andre A. Keller

CLERSE- Centre Lillois d'Etudes et de Recherches Sociologiques et Economiques UMR/CNRS  
8019

Universite de Lille 1 Sciences et Technologies  
Cite Scientifique 59655 Villeneuve d'Ascq Cedex FRANCE  
andre.keller@univ-lille.fr

**Abstract:** This study extends to the natural resource and environmental economics the use of the conventional circuit analysis and control in engineering. Resources and environmental management problems are investigated with help of continuous-time and discrete-time systems: optimal use of natural resources, growth models with polluting events and fishery models with open-access to the industry. This study introduces the fundamental block-diagram approach, with small-size applications to natural resources, pollution and fisheries management problems. The software MATHEMATICA (version 7.0.1.0) and its application packages are used for analyzing and solving the systems, symbolically and numerically.

#### Brief Biography of the Speaker:

At present, Professor Andre A. Keller (66) is an associate researcher in mathematical economics with application to environment problems and related modeling techniques at the CLERSE a research unit of the French Centre National de la Recherche Scientifique (CNRS) at the University Lille 1, for Sciences and Technologies. Prof. Keller received his PhD in Economics (Operations Research) in 1977 from the Universite de Paris. He taught applied mathematics (linear and nonlinear optimization techniques) and econometrics, microeconomics, theory of games and dynamic macroeconomic analysis. Since 1970, he has been chief econometrician at the Centre d'Observation Economique of the Chamber of Commerce & Industry of Paris. His experience includes macroeconomic, regional studies and commercial statistics: building econometric systems for short run analysis, analyzing policy impacts and forecasting, monthly time-series treatments. At the same time, he contributed to teaching microeconomics with the Universite de Paris. Since 1980, he has been Associate Professor at the Universite de Paris and Researcher in a research unit of the CNRS. His experience centers are on building and analyzing large scale macro-econometric models, as well as forecasting. Since 1985, his research interest has concentrated on high frequency time-series modeling with application to the foreign exchange market: spectral properties of usual filters, automatic selection of ARIMA models, efficiency tests. Since 1990, Prof. Keller's research is centered on discrete mathematics (graph theory), stochastic differential games and tournaments, circuit theory of systems, dynamics and optimal control in economic modeling under uncertainties and in a fuzzy environment. Prof. Andre A. Keller's publications consist in writing articles and co-authoring books. The articles in scientific reviews are on model building with application to macroeconomics and international finance. The books chapters are on semi-reduced forms of econometric models (Martinus Nijhoff, 1984), econometrics of technical change (Springer and IIASA, 1989), advanced time-series analysis (Woodhead-Faulkner), circuits enumeration in digraphs (Springer, 2008), stochastic differential games (Nova Science, 2009), optimal fuzzy control (InTech, 2009), circuit analysis (Nova Science, forthcoming 2010).

## Plenary Lecture 8

### The advance experimental and numerical studies of water turbulent jets



**Prof.dr.ing. Dan Victor Cavaropol**

dean of the Fire Engineering Faculty,  
“Alexandru Ioan Cuza” Police Academy – Fire Officers Faculty,  
1A, Privighetorilor Street, sector 1, Bucharest, ROMANIA  
cavaropold@gmail.com

**Abstract:** This Lecture presents recent research in the field of free shear flows, especially those of the turbulent jets. The intervention in the extinguishing process in the real fire needs more information about the zones, and the splitting process, the diameters of the drops formed. The natural scale experiments was carried out , and also a numerical simulation, considering the instability of a water turbulent jet. These results gives important information about how and where must be a firefighter positioned in order to extinguish a fire in a shorter time, whit a minimum amount of water.

**Brief Biography of the Speaker:**

Dan Victor Cavaropol is Professor Dean of the Fire Officers Faculty of Police Academy, Bucharest, Romania. From 2003 to 2007 he was Assistant Professor while from 1999 to 2003 he was Lecturer while from 1995 to 1999 he was a University Assistant. He received his Ph.D. Engineering Diploma – Hydraulics and Hydrokinetics in 1999 from the Technical University of Civil Engineering of Bucharest (UTCB), Romania

## Plenary Lecture 9

### The importance of results dissemination within multinational environmental projects. Case study: Project CIVITAS – SUCCESS



**Professor Catalin Popescu**  
Department of Management and Marketing  
University of Oil and Gas from Ploiesti,  
ROMANIA  
cpopescu@upg-ploiesti.ro

**Abstract:** The main purpose of projects co-financed by European Community is to enhance the life of European citizens by implementing measures with immediate or long term effect. One of the main sectors targeted by the EC projects is the transport sector. The transport sector plays a critical role in modern economies, but the sector also accounts for an increasing share of energy end use and gaseous emissions. In the European Union the proportion of energy used by transport accounts for 29%, industry consumes 32%; and residential and other sectors the remaining 39%. Land transport accounts for 86% of total EU consumption in the transport sector, and almost all the energy used is in the form of oil products. This presents a challenging problem as regards security in energy supply. More than 80% of EU citizens live and work in cities, and it is here that the environmental problems caused by the transport sector become most acute. Irrational use of energy combines with environmental degradation, which in turn is linked to increasing traffic congestion. Program CIVITAS II specifically calls for the use of technologies, which are developed but not yet mainstream and the focus should be on short/medium term alternatives, i.e. innovative bio-fuels and natural gas, including hybrid vehicles that use these fuels. SUCCESS (Smaller Urban Communities in CIVITAS for Environmentally Sustainable Solutions) contributed to the implementation of many of the EU's policies, especially environment, energy and transport. It also answers to various questions of European wide interest and of strategic importance.

#### **Brief Biography of the Speaker:**

Dr. Catalin Popescu is Professor of Management at University of Oil and Gas from Ploiesti, Romania. His research and consulting interest include general management, project management, quantitative methods for business and management, human resource management, engineering management, operations management and management information systems. He received in 1991 a degree in Engineering, a degree in Management (2000) and a PhD (2001) in Automated Systems concern Modeling and simulation of production systems, from the University of Oil and Gas from Ploiesti, Romania. Dr. Popescu has published over 125 articles and conference papers, 7 books and he was involved in more than 19 scientific research grants and international projects. He is member of AMIER (Managers and Economical Engineers Association from Romania), COLEAD (International Research Society in Leadership and Organizational Culture), EURAM (European Academy of Management), IBIMA (International Business Information Management Association) and IMTA Alumni Association (International Management Teachers Academy) from Slovenia. His international experience includes presentations and participation with papers in many places all over the world, in more than 20 countries. On the other hand, Dr. Catalin Popescu is now Vicedean of Economics Faculty within University of Oil and Gas from Ploiesti, Romania. Dr. Popescu is assessor in many academic and scientific organizations such as: WSEAS (World Scientific and Engineering Academy and Society), ANCS (National Agency for Scientific Research for the european projects under POS – CCE competition) and ARACIS (Romanian Agency for Quality Assurance in High Education) for the domain: Engineering and Management.

## Plenary Lecture 10

### Achieving the Best Practices in Lightning Protection System



**Senior Lecturer, Dr. Mohd Zainal Abidin Ab Kadir, PhD, MIEEE**  
Centre of Excellence on Lightning Protection (CELP),  
Dept. of Electrical and Electronics Engineering,  
Faculty of Engineering,  
UPM, Selangor, MALAYSIA  
mzainal@eng.upm.edu.my

**Abstract:** There are 2000 thunderstorms in progress at any time resulting in 100 lightning flashes to ground per second; this is 8 million per day. It causes of 24000 lightning deaths and other 240000 are injured per year. These data proves the critical needs for lightning protection system. In general, there are a lot of issues with regards to the selection of proper lightning protection systems. From the time of the first installation to the present day, characterization of the effectiveness remains a recurring question. Sustainability is an important criterion in ensuring the chosen protection system is governed by the international standards and of course technically and scientifically proven in effectiveness. The development of lightning protection principle throughout the world is based on solid science. Any scientific method can be summed up after the theory is formed, tested and conclusion is drawn. For the past 250 years, the lightning protection systems have been intensively studied and have been proven effectively many times. Field data recorded provides provide conclusive evidence that conventional lightning protection systems can provide substantial reduction in lightning-related incidents. The data clearly demonstrates the validity of the basic technology when the requirements are properly applied and adequately maintained. Therefore, the questions of what, why, when, where and how are remains valid towards achieving the best practice in lightning protection system.

#### **Brief Biography of the Speaker:**

Dr. M. Z. A. Ab Kadir graduated with B.Eng degree in Electrical and Electronic from Universiti Putra Malaysia in 2000 and obtained his Ph.D from the University of Manchester, United Kingdom in 2006 in High Voltage Engineering. Currently, he is a Senior Lecturer in the Department of Electrical and Electronic Engineering, Faculty of Engineering, Universiti Putra Malaysia. To date he has authored and co-authored over 50 technical papers comprising of national and international conferences proceedings and citation indexed journals, as well as owned a patent for his SPD design. His research interests include high voltage engineering, insulation coordination, lightning protection, lightning injury analysis and power system transients. Dr. Ab Kadir actively involved in the professional activities and currently is an IEEE Member (PES, EMC, Insulation and Dielectric Societies), Member of AGU, Member of IAENG, Member of Malaysia Energy Centre (PTM), Ex- Comm. IEEE Malaysia Section, Ex-Comm. IEEE PES Chapter, Working Group Member of IEEE PES Lightning Performance on Overhead Lines and also the Chairman/Director of Centre of Excellence on Lightning Protection (CELP), based in Universiti Putra Malaysia (UPM).



## Plenary Lecture 11

### Controlled stochastic jump processes



**Dr. A.B.Piunovskiy**

Dept. of Mathem. Sciences,  
The University of Liverpool, Peach St.,  
Liverpool L69 7ZL, UK

Phone: +44-151-7944737 Fax: +44-151-7944754

E-mail: piunov@liv.ac.uk

<http://www.maths.liv.ac.uk/piunov>

**Abstract:** Such processes are widely used in Engineering Sciences, Biology, Insurance, Inventory Theory and so on. After describing mathematical models, we shall present a series of meaningful examples. One of the most powerful methods of obtaining an optimal control strategy is Dynamic Programming. Another modern method of attack is so called Convex Analytic Approach. In this lecture the both methods will be briefly discussed. The second half of the lecture will be devoted to more special models. First, we concentrate on the processes with local transitions, like birth-and-death processes. They are known to be successfully approximated by deterministic differential equations under so called "fluid scaling". New results on the accuracy of such approximation will be presented. Secondly, a new look at the well known "C-mu-rule" in the Queuing Theory will be discussed: we shall compare the stochastic and deterministic versions. Finally, we shall stop on applications of the theory to the optimal buffer sizing for Internet routers. The last several minutes will be devoted to more general models, open questions and new challenging real life problems.

**Brief Biography of the Speaker:**

Dr. A.Piunovskiy was born in Moscow, Russia, in 1954. He graduated from the Moscow Institute of Electronic Technology (MIEM) with degrees in Electrical Engineering and Applied Mathematics, and supported the PhD thesis in 1981. Dr.A.Piunovskiy worked in MIEM and IFTP (Moscow State Inst. of Physics and Technology). In 1999 he received the Doctor of Science degree in Applied Mathematics. Since Feb. 2000, he is with Dept. of Mathem. Sciences, the University of Liverpool, currently holding the post of Reader. Research interests include Optimal control of dynamical systems, Controlled random processes; Constrained problems of optimal control; Approximations to controlled random processes and their accuracy; Computer simulation; Application to optimization problems in Operational Research, in Technical Systems, in Reliability Theory, Queuing Theory, Teletraffic, Finances, Economics, Ecology, and Epidemiology. Dr. A.Piunovskiy received multiple grants from the Russian Fund for Basic Research, London Mathematical Society, the Royal Society, EPSRC and so on. He published more than 80 works, including a textbook and a scientific monograph. Another monograph is in preparation.

## Plenary Lecture 12

### Resonant Absorption of Long Waves By Linear Microstructures



**Dr. Vladimir V. Arabadzhi**  
Inst Applied Physics Russian  
Aca Sci Ulianov st 46 Nizhny  
Novgorod 603950.  
RUSSIA

Fax: 7-(831)-436-59-76,  
E-mail: v.arab@hydro.appl.sci-nnov.ru

**Abstract:** The effect of resonant absorption of long waves by the oscillator of little gabarits is investigated analytically and numerically. This effect means that absorption cross-section of the oscillator (monopole, dipole...) is defined by wavelength absorbed only, and does not depend on wave dimensions (much smaller, than the wavelength absorbed) of the oscillator. The expression of optimum amplitudes of excitation of the group of degrees of freedom (or oscillators) in the boundary problem of general type is obtained in the form of generalized velocities and generalized forces. Using the linear microstructures (formed by monopoles, which are located on the axis periodically) we investigated the possibility to achieve the maximum absorption cross-section of the acoustic waves by these microstructures of small wave dimensions. We consider the examples of linear microstructures, which provide unlimited logarithmic, linear and square growing of the total absorption cross-section, with growing of the quantity of elements (monopoles) in the linear microstructure with wave dimensions remaining small. The examples of cooperative and the individual strategies of absorbing oscillators are compared too. The results obtained can be used for another waves: for electromagnetic waves, water surface waves, waves of bending in elastic plates, etc.

**Brief Biography of the Speaker:**

ARABADZHI VLADIMIR VSEVOLODOVICH, physicist, researcher; born Minsk, Belarus, Apr. 22, 1956; s. Vsevolod Isidorovich Arabadzhi and Valentina Ivanovna Arabadzhi; m. Olga Alexeevna Vasil'eva, Aug. 11, 1979; child, Ludmila Vladimirovna. BS, Gorky State U., Russia, 1978, PhD in Radiophysics, 1994. Engr. Radiophys. Inst., Nizhny Novgorod, Russia, 1978-81; with Inst. Applied Physics, Russian Acad. Sci., Nizhny Novgorod, Russia, 1981-94, sr. scientist, 1994-. Contbr. Articles to prof. Jours. Achievements include inventions in active wave control. Area of interests: wave thrust, reducing of acoustical and radio visibility of physical bodies.

## Plenary Lecture 13

### Building Awareness and Understanding of Electrical Ecosystems as Confluence of Human Technical Applications and Earth Natural Systems



#### Prof. Cornelia Aida Bulucea

Electrical Machines and Environmental Engineering Department  
Faculty of Electromechanical and Environmental Engineering  
University of Craiova  
ROMANIA  
abulucea@gmail.com

**Abstract:** The focus of this presentation is to enhance the way of thinking that human activities cannot be separated from the functioning of the entire system on Earth. Learning from the Nature means to accept that the technical systems processes involving energy conversion and matter transformation need to be linked to environment engineering. An approach within the Industrial Ecology framework of technical systems (created by humans) and ecological systems (created by Nature) as parts of the same system, the industrial ecosystems, could provide a holistic view of the interactions and symbiosis interrelationships among human activities, industrial practices and ecological processes. Although Science not clarified and unified technical and ecological viewpoints, a set of conditions for the performance of sustainable electrical systems should be formulated. This presentation goes on to adopt a dualist view, incorporating technical and environmental dimensions, to describe exergy applicability to electrical ecosystems. Drawing up a description of the electric system as an industrial ecosystem, with its limits and components, defining the systems operation regimes and assessing the equilibrium points of the system within the two reference frames represent the appropriate steps of the industrial ecosystem metabolism analysis.

#### Brief Biography of the Speaker:

Cornelia Aida Bulucea is currently an Associate Professor in Electrotechnics, Electrical Machines and Environment Electrical Equipments in the Faculty of Electromechanical and Environmental Engineering, University of Craiova, Romania. She is graduate from the Faculty of Electrical Engineering Craiova and she received the Ph.D degree from Bucharest Polytechnic Institute. In Publishing House she is author of four books in electrical engineering area. Research work is focused on improved solutions for electrical networks on basis of new electric equipments and environmental impact of energy and electric transportation systems. She has extensive experience in both experimental and theoretical research work, certified by over 70 journal and conference research papers and 15 research projects from industry. She has held in the Association for Environment Protection OLTENIA and she is a regular invited keynote lecture for environmental engineering symposia organized by Chamber of Commerce and Industry OLTENIA. Due to WSEAS recognition as huge scientific Forum she participated in seven WSEAS International Conferences, presenting papers and chairing sessions. She was Plenary Lecturer in the 9th WSEAS/IASME International Conference on ELECTRIC POWER SYSTEMS, HIGH VOLTAGES, ELECTRIC MACHINES (POWER'09), held by the University of Genova, Genova, Italy, October 17-19, 2009, in the 4th IASME/WSEAS International Conference on ENERGY&ENVIRONMENT (EE'09), held by the University of Cambridge, Cambridge UK, February 24-26, 2009 and in the 8th WSEAS International Conference on POWER SYSTEMS (PS'08), held by the University of Cantabria, Santander, Spain, September 23-25, 2008. She is very proud by her over 20 papers published in the WSEAS Conferences Books and 7 papers published in WSEAS TRANSACTIONS ON ENVIRONMENT AND DEVELOPMENT, WSEAS TRANSACTIONS ON CIRCUITS AND SYSTEMS and WSEAS TRANSACTIONS ON ADVANCES IN ENGINEERING EDUCATION.

## Plenary Lecture 14

### Strategic Alternatives for the Transport Sector and Fuel Consumption in Brazil



**Professor Hugo Ferreira Braga Tadeu.**

Professor of Supply Chain Management and Operations Research for graduate and specialization programs in Catholic University, Fundacao Joao Pinheiro e Fundacao Dom Cabral  
BRAZIL  
hugofbraga@gmail.com

**Abstract:** This work proceeds a study of the national transport sector, for the fuel consumption and possible alternatives for the long term, in relation to the adoption of the Monte Carlo Model simulation. Through data collection and the selection criteria related to the problem are proposals and optimized objective functions, aiming to maximize and minimize the National GDP and the GDP of Transportation. Certain restrictions apply, involving road, rail, sea, air, demand versus fuel consumption and implicit economical variables, all in an optimal condition. Based on the obtained results, the influence of each constraint in the objective functions are analyzed, seeking the best scenarios and long-term strategies. Through sensitivity analysis, whose visualization is made possible by the use of linear programming methods and computer systems available look for and reveal trends of the array for transport and dominant energy source. Therefore, data analyses, obtaining results from the simulation models, are revealed essentially to clarify the long-term behavior for different values of the mathematical model proposal.

**Brief Biography of the Speaker:**

Hugo Ferreira Braga Tadeu is professor of Supply Chain Management and Operations Research for graduate and specialization programs in in Catholic University, Fundacao Joao Pinheiro e Fundacao Dom Cabral. He holds a BSc from Ibmec Business School, MSc in Electrical Engineering and DsC in Mechanical Engineering from Catholic University, Brazil. He published over 82 opinion papers, 16 referred journal papers in the areas of supply chain management and operations research and two books in the same area. He writes articles for influentials newspapers in Brazil, like O Tempo and Estado de Minas. Hugo Tadeu speaks regularly on the subject of logistics and working with many international firms. He is a reviewer for the European Journal of Operations Research, Revista Mundo Logistica and among others in Brazil. He is partner of IELOG (Instituto de Estudos em Logistica), a logistic group in Brazil and works with Instituto Millenium, a liberal think tank. Research interests: supply chain management, logistics, stocks and operations research.

## Plenary Lecture 15

### The Adoption of eBanking: an Application of Theories and Models for Technologies Acceptance



**Associate Professor Liliana Mihaela Moga**

Faculty of Economics

Department of Finance and Economic Efficiency

Dunarea de Jos University, Galati, ROMANIA

[liliana.moga@gmail.com](mailto:liliana.moga@gmail.com)

**Abstract:** In an ever-developing society, a strong, viable economy is vital for any country that seeks to survive on the global market and to provide upwardly living standards for its citizens. Recognizing the above mentioned points as mandatory, Romania is taking steps to develop its electronic banking services to meet 21st century global standards. The eBanking services gained the attention of a major part of the traditional banking services customer because of the great importance of the financial activities within the daily life. This must be a plus for the bank, but this hypothesis is not confirmed by the real life. The paper identifies the factors that influence the customers' intention to use the electronic version for banking services. The user acceptance of Internet as new technologies that transform some traditional services and activities is a topic of interest for many professionals and researchers working in various domains. This paper presents the main theories employed in assessing the technology acceptance (theory of reasoned action, theory of planned behavior) as well as the technology acceptance models that have been developed on the basis of these theories. The focus of the paper is on the model develops and, implicitly, on the hypotheses that have to be tested in order to validate a model for the Internet acceptance in traditional banking services, based both on the content of the main theories employed in assessing the technology acceptance as Information Diffusion Theory, Trust, Technology Acceptance Model, Decomposed Theory of Planned Behavior and empirical studies, too.

#### **Brief Biography of the Speaker:**

Liliana Moga graduated Dunarea de Jos University in 1997 with a degree in Food Economics and then in 2001 with a degree in Informatics for Business. In 2004, she obtained a Master's degree in the Management of European Programmes and Politics. She has defended her PhD thesis on Value-Based Software Engineering at the Academy of Economic Studies in Bucharest, Management Department. She has ten years' professional experience as an academic and a researcher. Her interests are related of the use of ICT in economics, as a reflection of her work experience with an ICT companies and as an Associate Professor for Dunarea de Jos University in Financial Information Systems and Software. She is author/co-author of more than 70 papers published in international journals or presented at international conferences. Also, her research activity is focused on Management Information Systems, Information Technologies for Quality Safety Traceability and on Models for ICT adoption in banks, enterprises and farms.

She is member of External Reviewer of European Journal of ePractice, The IPSI BgDTransactions on Internet Research, Issues in Computer Science and Engineering, The IPSI BgD Transactions Advanced Research, Trans-disciplinary Issues in General Science and Engineering, African Journal of Biotechnology, African Journal of Agricultural Research, Journal of Community Informatics, PISTA (International Conference on Politics and Information Systems: Technologies and Applications), WSEAS Conferences and member of Editorial board of Annals of Dunarea de Jos University. Also, she is a Program Committee member for IBIMA Conference on Knowledge Management and Innovation in Advancing Economies and for SOIC (International Symposium on Social and Organizational Informatics and Cybernetics).

Also, she is a member of Association for Technology and Internet, Alumni DiploFundation, Giganet, ePracice and Global Knowledge Partnership Network.

## Plenary Lecture 16

### Environment Monitoring Based on Sensor Networks and Artificial Intelligence



#### Professor Constantin Volosencu

Department of Automatics and Applied Informatics

“Politehnica” University of Timisoara

Bd. V. Parvan nr. 2, Timisoara 300223

ROMANIA

constantin.volosencu@aut.upt.ro

**Abstract:** This paper presents some considerations on the applications in environment monitoring based on some concepts as: estimation, fault detection and diagnosis, theory of distributed parameter systems, applied to the physical processes from the environment, artificial intelligence, with its tool adaptive-network-based fuzzy inference and the intelligent wireless ad-hoc sensor networks. The environment may be seen as a complex ensemble of different distributed parameter systems, described with partial differential equations. Sensor networks have large and successful applications in monitoring the environment, they been capable to measure, as a distributed sensor, the physical variables, on a large area, which are characterizing the environment and to communicate at long distance the measured values, form the distributed parameter environmental processes. Using the modern intelligent wireless sensor networks multivariable estimation techniques may be applied in environment monitoring, ting distributed parameter systems. Nbase o these concepts environment monitoring becomes more easily and more performing. The paper presents some applications in environment monitoring, based on artificial intelligence, allowing treatment of the large, complex, non-linear and multivariable system of the environment by learning and extrapolation.

#### Brief Biography of the Speaker:

Constantin Volosencu is a professor at “Politehnica” University of Timisoara, Romania, Faculty of Automatics and Computers, Department of Automatics and Applied Informatics. He graduated “Traian Vuia” Polytechnic Institute of Timisoara, Romania, in 1981, as an engineer in automatics and computers. He has a doctorate in automatics at “Politehnica” University of Timisoara, Romania. Prof. Constantin Volosencu has researches in the field of linear control systems, fuzzy control, neural networks, control of electrical drives, system identification, sensor networks, fault detection and diagnosis and distributed parameter systems. He is author of 10 books, over 130 scientific papers published in journals and conference proceedings and 27 patents. He managed over 30 international and national research projects. From 1982 to 1991 he worked as a research and design engineer at “Electrotimis” Enterprises Timisoara, Romania in the field of electrical drives. He developed electrical equipments for machine tools, spooling machines, high power ultrasonic installations and other. Prof. Constantin Volosencu is a member of the Editorial Review Board, Computer Science, Computer Engineering, BCIS, MIS, at Scientific Journals International SJI, member in the Authors Advisory Board at Journal of Biochemical Technology. Member of S.R.A.I.T. and S.I.E.A.R Romania, member of IEEE Control System Society and Computational Intelligence Society. Member in the scientific committees of international conferences. In the frame of WSEAS he is author of 17 papers published at WSEAS conferences and 6 papers published in WSEAS transactions, plenary speaker at WSEAS conferences: 9th WSEAS Int. Conf. on Automatics & Information (ICAI'08), Bucharest, Romania, 2008, 8th WSEAS Int. Conf. On Simulation, Modeling and Optimization (SMO '08), Santander, Spain, 2008, 8th WSEAS International Conference on Signal Processing, Robotics and Automation (ISPRA '09), Cambridge, U.K., 2009, 10th WSEAS Int. Conf. on Automation & Information (ICAI'09), Prague, Czech Rep., 2009, 11th WSEAS International Conference on Automatic Control, Modeling and Simulation (ACMOS '09), Istanbul, May 30 – June 1, 2009, 9th WSEAS Int. Conf. on Simulation, Modeling and Optimization, SMO'09, Budapest, Hungary, 3-5 Sept. 2009, the 1st Int. Conf. on Manufacturing Engineering, Quality and Production Systems, MEQAPS'09, Brasov, Romania, Sept. 24-26, 2009

## Plenary Lecture 17

### Current Measurement Trends in Financial Reporting: From Historical Costs towards Fair Value Concept (and Back?)



#### Senior Lecturer Dr. JIRI STROUHAL

Department of Financial Accounting and Auditing  
University of Economics Prague, CZECH REPUBLIC  
strouhal@vse.cz

**Abstract:** Measurement in financial reporting is one of factors which determines the quality and reliability of presented information. There may be seen a conflict between the requirements for relevance and timeliness of measurement on one side and the reliability and conclusive evidence on the other side. However, it shall be stated that the important problem of measurement issues is the possibility of subjective manipulation with values, which is possible when using certain measurement bases.

Upon economic boom there can be seen higher optimism of investors which leads towards requirement of measurement of all accounting items at fair value, which mainly represents current market prices of assets. Using this concept means the turn from the prudence principle and conservative historical costs concept in financial accounting. Moreover fair value concept in financial accounting leads to higher tendency of revaluation assets or liabilities affecting profit or loss of the company.

Upon recession users reevaluate their views on accounting methods, especially the measurement bases. When we try to find out the reasons of economic crisis, we can hear opinions that it was very optimistic information given by fair value accounting in the period of economic boom. Current economic crisis may evoke the renaissance of conservative approaches in measurement, especially the applicability of prudence principle. Confidence in financial market upon crisis is thrilled; there can be seen strong price swings.

#### **Brief Biography of the Speaker:**

Jiri Strouhal, Ph.D. (FAIA, CAT, ECA, FWBI) was born on 15.5.1980 in Prague. He has graduated from the University of Economics in Prague in 2003 and earned his Ph.D. in Accounting and Financial Management there in 2005. Currently he is senior lecturer of the Department of Financial Accounting and Auditing of University of Economics in Prague. His major is financial reporting of SMEs and measurement of financial securities. He is also a consultant in the field of finance and financial reporting and provides public lectures. He is an author (or co-author) of more than 20 papers in refereed international journals and 12 monographs. He is a editorial board member of Journal of Economics and Finance (University of Johannesburg, South Africa), International Journal of Accounting Information Science and Leadership (Intellectbase Consortium, United States). Upon accounting professional certification scheme (based on ACCA) he achieved the "accounting expert" degree in 2006. From 2007 he is an Executive Board Member of the Chamber of Certified Accountants Czech Republic (from 2009 Vice-President of this Chamber) and member of the Committee for Education and Certification of Union of Accountants CR.

## Plenary Lecture 18

### Relation between Organizational Culture and Work Motivation in a Romanian State University



#### **Prof. CUCU-CIUHAN GEANINA**

Faculty of Social Sciences and Humanities, Department of Psychology  
University of Pitesti, ROMANIA  
geanina.ciuhan@upit.ro

**Abstract:** In Romanian public policy there is a lot of talking these days about the inefficiency of the educational institutions and the need for an educational system reform. We think that an important part of this national problem is the deficient organizational culture of each educational institution. The lecture presents the results of a research study that aimed to identify the type of the organizational culture existent in a Romanian state university, the way it is perceived by the employees, and identifying the type of the organizational culture wanted by the employees. We also evaluated the work motivation, emphasized the association with the type of the organizational culture and the correlation between a series of classificatory variables and the perception of the organizational climate. The research sample included a number of 102 university teachers, aged between 25 and 57, from assistant professors to full professors. We used two measures: ESA Questionnaire (Ciucurel, 2006), for evaluating the work motivation, and Organizational Culture Questionnaire (Harrison, Stokes, 1992). The results showed that the main organizational culture existent was the power type and that the employees hope for a support type. In what concerns the work motivation, teachers from the university had a high self-actualization motivation.

#### **Brief Biography of the Speaker:**

CUCU-CIUHAN GEANINA is Professor (2007-onwards), Associate Professor (2004-2007), Lecturer (2000-2004) - Faculty of Social Sciences and Humanities, Department of Psychology

Assistant Professor (1999-2000), Faculty of Theology, Department of Social Sciences

#### **PUBLICATIONS:**

##### **Books:**

1. Geanina Cucu-Ciuhan, Primary-school pupils' Psychology: Normal Development, Psychopathology and Psychotherapy, SYLVI Publishing House, Bucharest, 2000, (ISBN: 973-9488-44-7).
2. Geanina Cucu-Ciuhan, Hyperactive Child Psychotherapy: an experiential Approach, SYLVI Publishing House, Bucharest, 2001, (ISBN: 973-9488-93-5).
3. Geanina Cucu-Ciuhan, Introduction into Psychological Research, The Academy of High Military Studies Publishing House, Bucharest, 2003, (ISBN: 973-8317-80-0).
4. Geanina Cucu-Ciuhan, Sorina Doina Trofin, Educating children with disruptive Behavioral Disorders, SYLVI Publishing House, Bucharest, 2003, (ISBN: 973-628-051-9).
5. Geanina Cucu-Ciuhan, Qualitative Research in Psychology, SYLVI Publishing House, Bucharest, 2005, (ISBN: 973-628-144-2).
6. Geanina Cucu-Ciuhan, Efficiency of experiential psychotherapy with the hyperactive child, SPER Publishing House, Bucharest, 2006, (ISBN: 793-8383-35-8).
7. Cucu-Ciuhan G., Ciucurel M, Vitalia I. , Raban-Motounu N., Anghel E. , Ionescu C., Vasile A., Stan A., Experiential intervention in children with disruptive behavior disorders – psychological assessment and psychotherapy, Pitesti University Publishing House, 2008, (ISBN:978-973-690-746-3).

##### **Collective volumes:**

1. Co-author of the Treatise: Child's Psychopathology, Counseling and Psychotherapy, Editor: Professor Iolanda Mitrofan, Ph.D., SPER Publishing House, Bucharest, 2001, (ISBN: 973-99221-9-8).
2. Co-author of the Treatise: Steeple chase of Human Development, Editor: Professor Iolanda Mitrofan, Ph.D., Polirom Publishing House, 2003, (ISBN: 973-681-440-8).

Journal articles: 33 papers published in national recognized journals.

International conferences: more than 50 papers

She is also a Manager of national research grants