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Recent Advances in Civil and Mining Engineering

Proceedings of the 4th European Conference of
Civil Engineering (ECCIE '13)

Proceedings of the 1st European Conference of
Mining Engineering (MINENG '13)

Antalya, Turkey, October 8-10, 2013

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Table of Contents

<u>Keynote Lecture 1: Energy & Environmental Problems Facing India and Turkey and their Probable Solutions</u>	11
<i>D. P. Kothari</i>	
<u>Keynote Lecture 2: Confirming the Power of Probabilistic Evolution Approach: A Concrete Application to Get the Analytical Solution</u>	12
<i>Metin Demiralp</i>	
<u>Plenary Lecture 1: Why Does Sustainability Play an Important Role for Reinforced Concrete Structures?</u>	14
<i>Corneliu Bob</i>	
<u>Plenary Lecture 2: Expert System to Train Young Professionals on Influencing Shifting from Passive to Active Transport</u>	15
<i>Riza Atiq Rahmat</i>	
<u>Optimum Tuned Mass Dampers for Structures with Different Periods and Damping</u>	17
<i>Gebrail Bekdas, Sinan Melih Nigdeli</i>	
<u>Design of Bridge Shallow Foundations Using Finite Element Method</u>	23
<i>Ionuț Radu Răcănel</i>	
<u>Modeling and Simulation of Coal Winning Process on the Mechanized Face</u>	30
<i>Sorin Mihai Radu, Gabriel Dolea, Razvan Cretan</i>	
<u>Optimization of RC Beams for Various Cost Ratios of Steel/Concrete</u>	36
<i>Sinan Melih Nigdeli, Gebrail Bekdas</i>	
<u>The Stability of the Underground Structures Achieved in Salt Massif and their Monitoring</u>	41
<i>Mihaela Toderas</i>	
<u>Application of Support Vector Regression (SVR) for Monthly Evaporation Prediction</u>	52
<i>Meral Buyukyildiz, Humar Kahramanli, Gulay Tezel</i>	
<u>Gas Explosion Effects on Methane–Tank Elements</u>	60
<i>Mariana Pop, Corneliu Bob</i>	
<u>Fabrication and Construction of Steel Structures in Turkey, Common Errors and Remedies</u>	65
<i>Adem Aydoğdu, Ülkü Sultan Keskin, Yunus Dere, Humar Kahramanli</i>	
<u>Verification of Advanced Calculation Models for Fire Design</u>	73
<i>Raul Zaharia, Ioan Both</i>	
<u>Special Elements for Light Prefabricated Concrete Frames Used in Attic Solution</u>	78
<i>Catalina Maria Bocan, Cornel Farcas, Valeriu Stoian</i>	

<u>Restauration and Consolidation of the Masonry Arch of St. Catherine Church from Timisoara. A Case Study</u>	87
<i>Sevastean Ianca, Luminita Fekete-Nagy</i>	
<u>Sustainable Retrofitting of Blocks of Flats: Environmental, Economic and Social Aspects</u>	93
<i>Mirela-Adriana Szitar, Daniel-Mihai Grecea, Miodrag Popov, Marius Adam, Mircea-Paul Samanta</i>	
<u>Using Modular Structures with Built-in Utilities for Temporary Shelters</u>	103
<i>Otilia-Alexandra Tudoran, Daniel Grecea</i>	
<u>Influence on the Bearing Capacity of a Large Door and Window Cut-Out Opening in Precast Reinforced Concrete Wall Panel</u>	111
<i>Mihai Fofiu, Valeriu Stoian</i>	
<u>Influence of Fiber Type on Stone Mastic Asphalt Behavior</u>	116
<i>Carmen Răcănel, Adrian Burlacu</i>	
<u>Experimental Determinations on Glued Laminated Timber Specimens</u>	122
<i>Gruin Aurelian, Bob Liana, Furdui Ioan</i>	
<u>Analysis of the Stress State for Rails with Holes Near Joints</u>	129
<i>Ionuț Radu Răcănel, George Stoicescu</i>	
<u>Determination of the Remaining Bearing Capacity of an Existing Slab Using 3D Scanning Technology</u>	136
<i>Ioan-Andrei Bindean, Valeriu Stoian</i>	
<u>Considerations Regarding the Influence of Climatic Conditions on Pavement with Asphalt Layers</u>	141
<i>Carmen Răcănel, Adrian Burlacu</i>	
<u>Monitoring the Conflict Situations Using the Video Analysis in the Czech Republic</u>	148
<i>Vladislav Krivda, Ivana Mahdalova</i>	
<u>Clustering Method of Layered Rocks Based on Fuzzy Logic</u>	157
<i>Payam Rajabzadeh Kanafi, Hosein Zartaj, Sina Shaffiee Haghshenas, Mohamad Hosein Khiabani</i>	
<u>The Influence of Soil Moisture Content and Density on its Small Embankment Electrical Resistivity</u>	166
<i>Mohd Hazreek Zainal Abidin, Rosli Saad, Fauziah Ahmad, Devapriya Chitral Wijeyesekera</i>	
<u>CFRP Strengthening of Glued-Laminated Timber Beams Experimental Results</u>	175
<i>Ioan Furdui, Dan Diaconu</i>	
<u>Dynamic Characteristics and Seismic Performance Evaluation of Low Rise Existing RC Moment Resisting Frame using Microtremor Technique and Standard Code of Practice</u>	182
<i>Ahmad Fahmy Bin Kamarudin, Mohd. Effendi Bin Daud, Koh Heng Boon, Zainah Binti Ibrahim, Azmi Bin Ibrahim</i>	

<u>Numerical vs. Experimental Behaviour of Bolted Dual-Steel T-Stub Connections</u>	192
<i>Ana-Maria Pop, Daniel Grecea, Adrian Ciutina</i>	
<u>Identifying and Treating Urban Black Spots</u>	200
<i>Alina Burlacu, Otilia Pirlea</i>	
<u>The Testing Methodology of New Developed Steel Temporary Truss Footbridge Details in Case of Cyclic Loading</u>	207
<i>Michal Štrba, Marcela Karmazínová, Pavel Simon</i>	
<u>The Influence of the Asphalt Mixture Components on Asphalt Mixture Behavior</u>	211
<i>Carmen Racanel, Adrian Burlacu</i>	
<u>A Historic Local Road with Present-Day Urban Public Transport</u>	218
<i>Karel Zeman, Jan Petrů</i>	
<u>Predicting Braking Distance based on the Polished Stone Value of Aggregates in the Wearing Course</u>	225
<i>Alina Burlacu, Mihai Dicu, Carmen Răcănel</i>	
<u>Determination of Concrete Compressive Strength by Non Destructive Methods</u>	232
<i>Kubilay Kaptan, Uğur Kavlak, Onur Yılmaz</i>	
<u>Studies and Researches on Evolution of the Hydrostatic Level for an Urban Area</u>	236
<i>Vlad Așuencei, Ioan Tuns, Marius Mantulescu</i>	
<u>Foundation Solutions for 4 Blocks on a Heterogeneous Soil in Brasov</u>	242
<i>Măntulescu Marius, Tuns Ioan, Vlad Așuencei</i>	
<u>Modeling And Simulation of the Complex Mining Production Systems for Coal Extraction</u>	248
<i>Dinescu Stela, Andras Andrei</i>	
<u>A Graphical-Analytical Model used to Establishing the Mining Methods, the Operating Technologies and the Operating Technological Variants of a Deposit</u>	256
<i>Nicolae Dobrițoiu</i>	
<u>The Influence of Sea Water on Promenade Pavement</u>	268
<i>Otilia Pirlea, Alina Burlacu</i>	
<u>Computerised Modelling of Methane Releases Exhaust from a Retreating Longwall Face</u>	274
<i>Nicolae-Ioan Vlasin, Constantin Lupu, Marius Șuvar, Vlad-Mihai Păsculescu, Susana Arad</i>	
<u>Research on the Influence of the Local Mining Activities on the Sediments Quality of Băița Valley in Maramureș County, România</u>	278
<i>Irina Smical, Adriana Muntean, Ioan Bud, Victor Arad</i>	
<u>Environmental Impact of Mining at IARA Area</u>	285
<i>Victor Arad, Daniel Nistor, Gheorghe Chindris, Ladislau Radermacher</i>	

<u>Virtual Simulation – Useful Tool for the Technical Expertise of Events Generated by Explosions</u>	291
<i>Constantin Lupu, Emilian Ghicioi, Susana Arad</i>	
<u>Risk Assessment of Herja Mine Closure by Building a Retention Dam</u>	296
<i>Ioan Bud, Simona Duma, Dorel Gusat, Ioan Denut, Victor Arad</i>	
<u>Modeling of the Removal of Turbidity from Marble Suspensions via ANN (Artificial Neural Network)</u>	301
<i>Vildan Onen, Gulay Tezel, Esra Yel, Pinar Beyazyüz, Ilker Ali Ozkan</i>	
<u>Lake Level Prediction Using Artificial Neural Network with Adaptive Activation Function</u>	309
<i>Gülay Tezel, Meral Büyükyıldız, Humar Kahramanli</i>	
<u>Investigating the Effect of Soil Behavioral Model on the Performance of Micro Pile System Under Dynamic Loading</u>	314
<i>Mehran Honarmand Javan, Sina Shaffiee Haghshenas, Payam Rajabzadeh Kanafi, Hosein Zartaj</i>	
<u>Evaluation of Bus Signal Priority in Signalized Intersections with using Vissim</u>	319
<i>Riza Atiq O.K. Rahmat, Abdolreza Darvishpour, Mohammad Ganji, Foad Shokri, Amiruddin Ismail</i>	
<u>Warm Mix Asphalt Mixture Experience in Romania</u>	327
<i>Carmen Racanel, Adrian Burlacu</i>	
<u>Determination of the Temperature Distribution in the Bituminous Layers of Road Pavements</u>	334
<i>Marc Paul, Lucaci Gheorghe, Belc Florin, Costescu Ciprian</i>	
<u>Research Concerning the Impact of Heavy Traffic Upon the Rehabilitation Solution on a County Road</u>	339
<i>Belc Florin, Marc Paul, Lucaci Gheorghe, Costescu Ciprian</i>	
<u>Authors Index</u>	345

Keynote Lecture 1

Energy & Environmental Problems Facing India and Turkey and their Probable Solutions



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Abstract: It briefly discusses some important energy problems facing India and Turkey and presents the current electric generation scenario in most of the developing countries with facts and figures in respect of India. It is hoped that, with systematic, advance planning, through measures like co-generation, energy management, and energy conservation, the electric energy supply scenario of AD 2020 will be free of the perennial problems of power shortages, voltage fluctuations etc.

Brief Biography of the Speaker: D.P.Kothari is, presently, Director General of J B Group of Institutions ,Hyderabad. He obtained his BE (Electrical) in 1967, ME(Power Systems) in 1969 and Ph.D in 1975 from the Birla Institute of Technology & Science(BITS) Pilani, Rajasthan. Prior to assuming charge as DG, JBI ,Hyderabad, he served as DG RGI , DG VGI, Indore, Vice Chancellor, VIT, Vellore, Director in-charge and Deputy Director (Administration) IIT Delhi as well as Head in the Centre of Energy Studies at Indian Institute of Technology, Delhi and as Principal, Visvesvaraya Regional Engineering College, Nagpur.

He was Visiting Professor at the Royal Melbourne Institute of Technology, Melbourne, Australia, during 1982-83 and 1989 for two years. He was also NSF Fellow at Purdue University, USA in 1992. He is fellow of Indian National Academy of Engineering (INAE), Indian National Science Academy (FNASc), Institution of Engineers, India (IEI) and Institute of Electrical and Electronics Engineers (FIEEE).He has authored /co-authored/more than 725 papers in International/National Journals/Conferences & 30 books including Power System Engineering, 2e Electric Machines, 4e Electric Machines (Sigma Series), 2e and Basic Electrical Engineering, 3e. His fields of specialization are Optimal Hydrothermal Scheduling, Unit Commitment, Maintenance Scheduling, Energy Conservation (loss minimization and voltage control), Power Quality and Energy System Planning and Modeling.

Keynote Lecture 2

Confirming the Power of Probabilistic Evolution Approach: A Concrete Application to Get the Analytical Solution



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Abstract: The last three years accumulated a great pile of information about the Probabilistic Evolution Approach (PEA) which is under construction in the Group for Science and Methods of Computing (Demiralp's group) studies. Until now, the skeleton and the roof of the theory has been constructed and many details, as if muscles and other organs, have also been revealed. Now we know how to convert a given set of explicit first order ordinary differential equations accompanied by appropriate initial conditions to an infinite first order, linear, homogeneous set of ordinary differential equations with a denumerably infinite constant coefficient matrix; accompanied by a denumerably infinite initial vector value imposition. We could be able also to obtain Kronecker power series solution when the descriptive function (right hand side function) vector has a conical structure. Even we could have been able to get finitely many term involving analytic results for rather specific ODE structures. However we have never intended to perform a resummation over the Kronecker power series obtained in Probabilistic Evolution Approach applications even though the issue has been reduced to kernel separability where the telescope and monocular matrices are in use.

In this presentation first we focus on simplest first order explicit ordinary differential equation and its accompanying initial condition, where the right hand side function does not depend on the independent variable (time variable in the dynamical system terminology) of the considered ODE and has a second degree polynomial structure in the unknown function of the ODE under consideration. If there are certain commutativity relations exist in the descriptive function coefficient matrices then it is possible to produce a matrix algebraic analytic structure for the solution. To this end a very recently developed approach we have called "Constancy Added Space Extension (CASE)" can be used. This extends the state space of the ODE from one dimension to two dimension and makes it possible to get pure quadraticity at the descriptive function. Then, by using certain very fruitful properties of the Kronecker products and powers, it becomes to generate an analytical solution if the coefficient matrix appearing in the quadratic structure of the descriptive function has certain symmetry conditions and also commutativity conditions. The presentation aims to focus on these issues as the time permits.

Brief Biography of the Speaker: Metin Demiralp was born in Türkiye (Turkey) on 4 May 1948. His education from elementary school to university was entirely in Turkey. He got his BS, MS degrees and PhD from the same institution, Istanbul Technical University. He was originally chemical engineer, however, through theoretical chemistry, applied mathematics, and computational science years he was mostly working on methodology for computational sciences and he is continuing to do so. He has a group (Group for Science and Methods of Computing) in Informatics Institute of Istanbul Technical University (he is the founder of this institute). He collaborated with the Prof. Herschel A. Rabitz's group at Princeton University (NJ, USA) at summer and winter semester breaks during the period 1985-2003 after his 14 month long postdoctoral visit to the same group in 1979-1980. He was also (and still is) in collaboration with a neuroscience group at the Psychology Department in the University of Michigan at Ann Arbor in last three years (with certain publications in journals and proceedings).

Metin Demiralp has more than 100 papers in well known and prestigious scientific journals, and, more than 230 contributions together with various keynote, plenary, and, tutorial talks to the proceedings of various international conferences. He gave many invited talks in various prestigious scientific meetings and academic institutions. He has a good scientific reputation in his country and he was one of the principal members of Turkish Academy of Sciences since 1994. He has resigned on June 2012 because of the governmental decree changing the structure of the academy and putting political influence possibility by bringing a member assignation system. Metin Demiralp is also a member of European Mathematical Society. He has also two important awards of Turkish scientific establishments.

The important recent foci in research areas of Metin Demiralp can be roughly listed as follows: Probabilistic Evolution Method in Explicit ODE Solutions and in Quantum and Liouville Mechanics, Fluctuation Expansions in Matrix Representations, High Dimensional Model Representations, Space Extension Methods, Data Processing via

Multivariate Analytical Tools, Multivariate Numerical Integration via New Efficient Approaches, Matrix Decompositions, Multiway Array Decompositions, Enhanced Multivariate Product Representations, Quantum Optimal Control.

Plenary Lecture 1

Why Does Sustainability Play an Important Role for Reinforced Concrete Structures?



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Abstract: The idea of offering and assuring sustainable solutions for construction works is a new and very important target in this field. International and national organizations started to develop new standards related to sustainability issues in civil engineering which will play an important role in our every day lives.

Although concrete is the leading construction material, it is considered non-ecologic due to the great amount of CO₂ emission arising mainly, from the manufacturing of cement. In addition concrete has a lot of main disadvantages, like: small tensile strength, high density, low thermal insulation, water permeability, low ductility and so on. On the other hand, concrete has major advantages (fire resistance, durability, architectural flexibility, low cost, high stiffness, etc.) and the ability of changing its characteristics by using new materials and technology.

The present lecture is dedicated to the following subjects:

- General characteristics of ordinary concrete
- New trends of concrete properties
- Sustainability assessment of construction works
- Special aspects of concrete structures sustainability
- Author's researches on CO₂ uptake through concrete carbonation, self-compacting concrete and high performance concretes.

Brief Biography of the Speaker: Prof. Corneliu BOB, graduated at the University „Politehnica” of Timisoara – Romania in 1961 and Ph.D. Civil Engineering in 1971 at the same University. In 1990 he became professor of R.C. Structures and Ph.D. – Scientific Coordinator at the Civil Engineering Faculty in Timisoara. From 1996 till 2004 he was the Head of the National Building Research Institute – Timisoara Branch.

Professor Bob has also been very active in the Romanian Associations for Civil Engineering: National Association Engineering for Structural Analysis, Bucharest, Romanian Concrete Commission, Romanian Academy – Material Science.

Member of IABSE since 1992, Prof. Bob became the member in Permanent Committee, Commission WC-8 (WC-4), Editorial Board of Structural Engineering Documents (SED) and in the same time, vice-chairmen of IABSE Romanian Group. In the last years he has been involved, with good results, in the WSEAS activities (Editor-2009, Plenary Lectures-2009, 2010, 2012).

Prof. Bob has had many and major contributions in the field of Structural Engineering:

(i). He participated as designer at more than 70 structures projects. In the last 15 years his attentions was paid to the design of the RC prefabricated structures: 25 structures have been projected and built up with more than 100000 m² built surface. An important contribution of Prof. Bob in this field was in a patent concerning the „RC prefabricated structures with rigid nodes”.

(ii). A very important field of work was paid to evaluation and rehabilitation of existing buildings. He participated at 75 projects of maintenance and rehabilitation of some important structures affected by seismic actions, gas explosions as well as time environmental factors. A very notable contribution is the „Model of reinforcement corrosion in RC Structures”.

(iii). Prof. Bob C. has published many books and papers in Journals and Proceedings of National and International Meetings. The field of interest of works is: rehabilitation of structures, analysis and design of structures, durability of buildings, new special concrete types, building sustainability.

Prof. Corneliu BOB played an important role in development of assessing of existing structures and in design of new buildings and he has devoted great energy in promoting the role of students and young engineers as designers and researchers.

Plenary Lecture 2

Expert System to Train Young Professionals on Influencing Shifting from Passive to Active Transport



Professor Riza Atiq Rahmat
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Abstract: A growing number of Asian cities have high numbers of private car making up the majority of traffic. This has resulted in the negative impact of traffic congestion, road safety, air pollution and climate change. Many policy measures to reduce these problems have been implemented, such as widening the roads, limiting speed, upgrading the motorcycle lanes and upgrading public transport, but there are less measures and encouragement for the provision of active transport (cycling and walking) in Malaysia. This paper presents the development of an expert system to train young professional on implementation strategies for influencing of shifting from passive to active transport in the framework of sustainable urban transport. One of the process of organizing the available knowledge of active transport strategies is to capture the views among transportation experts regarding the most appropriate strategies to shift from motorized to active transport. There are eight (8) main objectives of transportation planning to achieve in planning of active transport such as congestion reduction, road and parking cost reduction, consumer cost reduction, crash risk reduction, air and noise pollution reduction, energy conservation, economic development benefits and liveable communities. As a result, apart from the main objectives, specific objectives on mobility management strategies are divided into four (4) major categories according to how they affect the travel, thus ; improves transport option, land use management, price incentive and other implementation programs is encoded in the expert system shell developed for the purpose by using shell expert system Kappa-PC version 2.4.

Brief Biography of the Speaker: Prof. Ir. Dr Riza Atiq obtained his B.Eng. (Civil Engineering) in 1980, M.Eng (Transportation Engineering) in 1991 from UTM and PhD from UKM in 2002. He started his academic carrier in UKM in 1994 after working as an engineer with City Hall of Kuala Lumpur for 14 years. While in City Hall he developed a transport model for Kuala Lumpur and surrounding area for planning purposes. He has five intellectual properties, three books, more than 100 scientific research papers and 14 innovation awards including one from Geneva, three from Korea and one from IEM. His research is mainly in Sustainable Urban Transport and Intelligent Transport System. His professional expertise includes urban transport planning, urban transport management and sustainable urban transport. His current post in Universiti Kebangsaan Malaysia (UKM) is the Director of Centre for Academic Advancement and research fellow at Sustainable Urban Transport Research Centre (SUTRA). . While holding the post, he initiated the formulation of 11 policies to transform the curriculum and teaching-learning practices in UKM. His professional qualification includes being a professional engineer (Civil Engineers, Board of Engineers Malaysia) and member of Road Engineering Association of Asia and Australasia.