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**Recent Advances in  
Geodesy and Geomatics  
Engineering**

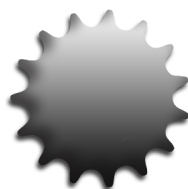
**Proceedings of the 1<sup>st</sup> European Conference of  
Geodesy & Geomatics Engineering  
(GENG '13)**

**Antalya, Turkey, October 8-10, 2013**

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## Keynote Lecture 1

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



Dr. D. P. Kothari  
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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

### The Application of GIS in Wireless Communication Systems with Diversity Combining in the Presence of Fading



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**Abstract:** The application of Geographic Information Systems (GIS) in designing of wireless communication systems with diversity combining in the presence of fading is very important. In wireless telecommunication systems various problems that reduce the range of connections, corrupt receipt of the antenna and increase the transmitter power needed, appear in wireless telecommunication systems. The troubles, which occur in wireless telecommunication systems, are different noise, interferences and fading. The diversity techniques for reducing the impact of disturbances on system performances are considered. There are space diversity, time diversity and frequency diversity systems. Here, the space diversity techniques will be discussed.

Fundamental obstacle in wireless telecommunication systems is fading. Fading is the signal envelope changing at the receiving site and it may be fast and slow fading. Fast fading is caused by multiple signal propagation paths. Slow fading is caused by the effect of shadows. Fast fading can be modeled by Ricean, Rayleigh, Nakagami-m, Nakagami-q, and Weibull probability density functions. In some cases, fast fading can be modeled with an inverse Gaussian probability density function. Slow fading can be modeled with log-normal and Gamma probability density functions. Also, slow fading can be modeled with Rician and Nakagami-m probability density function in some cases.

A large number of applications of geographic information systems is related to the telecommunications sector. Due to prediction the propagation and visualization of the signal range, these systems are widely used in various kinds of electromagnetic waves simulation in a particular environment where wireless telecommunications systems are projected. Of crucial importance for the design of these systems is the propagation of signals in space. These systems are used in designing of wireless and mobile telecommunication systems, radar networks, and radio-relay links. In all these cases the savings in time, human resources and material resources are achieved, because much of the design of the networks is the computer's work, without going out into the field.

**Brief Biography of the Speaker:** Dragana S. Krstic was born in Pirot, Serbia. She received the BSc, MSc and PhD degrees in electrical engineering from Department of Telecommunications, Faculty of Electronic Engineering, University of Nis, Serbia, in 1990, 1998 and 2006, respectively. Her field of interest includes telecommunications theory, optical communication systems, wireless communication systems, satellite communication systems etc. She works at the Faculty of Electronic Engineering in Nis since 1990. She participated in more Projects which are supported by Serbian Ministry of Science. She has written or co-authored more about 160 papers, published in Journals and at the International/National Conferences. She has also reviewed more articles in IEEE Transactions on Communications; IEEE Communications Letters; ETRI journal; C&EE Journal; Electronics and Electrical Engineering (Elektronika i Elektrotehnika) and other journals. She is the reviewer of the papers for many conferences and the member of technical program committees and international scientific committees of several scientific conferences. Also, she is the member of Editorial Board of International Journal On Advances in Telecommunications.



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