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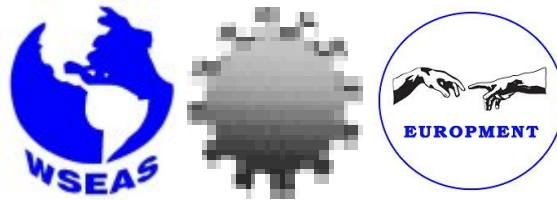
Proceedings of the 6th International Conference on Applied Mathematics,  
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**Vouliagmeni Beach, Athens, Greece, March 7-9, 2012**



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## Plenary Lecture 1

### Dynamic GP Models: An Overview and Recent Developments



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

**Brief Biography of the Speaker:**

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

## Plenary Lecture 2

### E-learning Methodology Development Model



**Professor Ph.D. Sarma Cakula**  
Faculty of Engineering  
Vidzeme University of Applied Sciences  
Cesu 4, Valmiera  
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**Abstract:** One of the most important prerequisites in base plan for long-term development of all countries is high education level in society what includes e-learning studies. With the progression of e-learning in society there is exponential growth of e-learning resources or knowledge items on the internet observed. Most of e-learning systems do not take into account individual aspects of person, ignoring the different needs that are specific to existing cognitive profiles. Teachers have been forced to search for possibilities to make e-learning more interesting and effective. The goal of the paper is to work out and create theoretical principles of using imitation modelling for e-learning course developing for building course methodology for individual use, according to the person's characteristics and performance, depending also on the concepts that the person knows. Simulation and modeling computer programs are concerned with construction of models for analyzing different perspectives and possibilities in changing conditions environment. The paper presents theoretical justification and evaluation of qualitative e-learning development model in perspective of advancing modern technologies. Theoretically grounded and practically tested model of developing e-learning methods using different technologies for different type of classroom, which can be used in professor's decision making process to choose the most effective e-learning methods has been worked out.

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

Sarma Cakula was born at 13th December 1960 in Latvia. Graduated with excellence from Latvia University Department of Physics and Mathematics in 1984 and holds Ph.D. in 2002. She started to work in Vidzeme University College (Vidzeme University of Applied Sciences –now) as a teacher. She is a director of Information Technology (IT) professional bachelor program and the Dean of Faculty of Engineering of Vidzeme University of Applied Sciences Latvia now. She is a professor of Information Technologies in the Faculty of Engineering. Also she manages some European and Norway fund projects. She is a member of the International E-Learning Association (IELA), the Latvian Information Technology and Telecommunications Association (LIKTA) and Latvian Universities Professor Association (LAPA). She has more than 30 scientific publications from 2006 in field of information technologies and pedagogic, mostly of them in the field of E-Learning. Also she takes part in Scientific Committee of different international conferences and Editorial Advisory on international journals. Latest of them are: International Online Workshop On "Writing a Research Paper"(IOW-WRP), July 17, 2011, Organized and Technically Co-Sponsored by MASAUM Network; International Conference Virtual and Augment Reality in Education (Vare 2011), 18th March, 2011, Valmiera, Latvia; International Conference on Intelligent Computing & Information Systems, Cairo-Egypt 2011; International Journal of Cyber Society and Education" ISSN 1995-6649 from 2009, International Conference „LEAFA 2010", 2010.g. 3-5.Jun. Hammamet, Tunisia, International Online Conference on Information Technology (IOCIT '11), October 30, 2011 and others.



## Plenary Lecture 3

### Conditions of Experiments for Verification of Gravity Control Possibility



#### Professor Vitaly O. Groppen

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North-Caucasian Institute of Mining and Metallurgy

Russia

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

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

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

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