Preface

The International Conference for Undergraduate and Graduate Students of Applied Mathematics (SCAM/ISCAM) has started in 1999. Until 2007, it was organized by two faculties of the Slovak University of Technology in Bratislava by the initiative of two people, namely Zdenka Riečanová from the Faculty of Electrical Engineering and Information Technology and Radko Mesiar from the Faculty of Civil Engineering. The original idea was to bring together young researchers and students and to give them an opportunity to present their achievements and ideas in the area of applied mathematics, informatics and various applications.

After one-year break, we decided to extend the scope of the Conference by computer science and to co-organize it in-turns by the Institute for Research and Applications of Fuzzy Modeling (University of Ostrava) and the Dept. of Mathematics of the Faculty of Civil Engineering (Slovak University of Technology in Bratislava) in a new guise under the acronym ISCAMI.

ISCAMI 2010 was organized in Bratislava, the capital of Slovakia. There were 56 talks presented at the conference by participants from Austria, Italy, Kazakhastan, Spain, Turkey, Czech Republic, and the Slovakia. Chosen participants were invited to submit papers into several special issues of international journals. This issue is one of them.

The first paper (*Discrete Duality Finite Volume Scheme for the Curvature-driven Level Set Equation*) by Dana Kotorová aims at the new numerical solution of the curvature driven level set equation [4] based on so-called discrete duality finite volumes like in [1].

In the second paper by Petra Medveďová (*Dynamic Model of a Small Open Economy Under Flexible Exchange Rates*) a three dimensional dynamic model of a small open economy, describing the development of net real national income, real physical capital stock and expected exchange rate of near future, which was introduced by T. Asada in [2], is analysed under flexible exchange rates. Formulae for the calculation of the bifurcation coefficients in the bifurcation equation of the model are derived and theorem on the existence of business cycles in a small neighbourhood of the equilibrium point is presented.

The next two papers focus on time series. First, Jana Lenčuchová (*Testing of Markov Assumptions Based on the Dynamic Specification Test*) shows an alternative approach to testing linearity against Markov-switching type non-linearity. The second paper by Anna Petričková (*Modelling of Dependence Structure of the Regime-Switching Models Residuals Using Autocopulas*) presents the testing the independence of time lagged residuals of SETAR models and description of the dependence of these residuals by means of auto-copulas [3].

The paper by Mária Ždímalová (*A Note on Large Cayley Graphs of Diameter Two and Given Degree*) presents (for diameter two) a construction for 'large' Cayley graphs of semidirect products of groups out of 'small' Cayley graphs of cyclic groups, such that the ratio of the order of the graph to the square of the degree of the graph is approximately the same for both the input and the output graphs.

The last four papers jointly focus on fuzzy approaches to decision-making processes. The very first of them by Iveta Bebčáková et al. (*On the Application of the Fuzzified Choquet Integral to Multiple Criteria Evaluation*), as the most theoretical one, aims at the fuzzification of the Choquet integral and its application to aggregation of partial evaluations.

Generally, aggregation operators are very often used in decision-making problems. The paper by Lucia Vavríková (*Multicriteria Decision Making and Rankings Based on Aggregation Operators (Application on Assessment of Public Universities and Their Faculties)* presents an interesting application from the field of ranking of the public universities and their faculties.

The paper by Jan Stoklasa et al. (*Academic Staff Performance Evaluation – Variants of Models*) is motivated by a very similar problematic but rather focused to smaller reseach units – the academic employees. It dicusses distinct possible approaches to evalutions of performance of academic employees and suggest the approach based on fuzzy rules.

Finally, the paper by Blanka Zemková et al. (*Fuzzy Sets in HR Management*) focuses on human resources management. This paper overcomes the problem of discrete scales standardly used in psychometrics by the use of fuzzy scales with a possible transcription to linguistic expressions.

Magda Komorníková, Martin Štěpnička

Special Issue Guest Editors

References

[1]   Andreianov, B., Boyer, F., Hubert, F.: Discrete Duality Finite Volume Schemes for Leray-Lions Type Problems od General 2D Meshes. Numerical Methods for PDE. 23, pp. 145-195, 2007

[2]   Asada, T.: Kaldorian Dynamics in an Open Economy, Journal of Economics No. 3, Springer-Verlag, Printed in Austria, pp. 239-269, 1995

[3]   Rakonczai, P.: On Modeling and Prediction of Multivariate Extremes. Mathematical Statistics Centre for Mathematical Sciences, Lund University, 2009

[4]   Sethian, J. A.: Level Set Methods, Cambridge University press, 1996