

**Foreword to the Special Issue on "New Trends in  
Databases and Information Systems"**

Database and information systems technologies have been rapidly evolving in several directions over the past years. New types and kinds of data, new types of applications and information systems to support them raise diverse challenges that ought to be addressed. Utilizing GPUs in database-related applications, the role of ontologies in information systems, social networks and other complex data analysis, including semantic reasoning in the information systems supporting, for instance, trading, negotiations, and bidding mechanisms are just some of the emerging research topics. This volume contains revised and extended selected papers that originally contributed to the workshops associated with the 16th East-European Conference on Advances in Databases and Information Systems (ADBIS 2012) and reported on the recent developments in the aforementioned areas.

ADBIS 2012 was held on September 17-21, 2012 in Poznan, Poland. The main objective of the ADBIS series of conferences is to provide a forum for the dissemination of research accomplishments and to promote interaction and collaboration between the database and information systems research communities from Central and East European countries and the rest of the world. The general idea behind the workshops was to collect contributions from various subdomains of the broad research areas of databases and information systems, representing new trends in these two important areas.

Each of the ADBIS 2012 workshops had a possibility to invite up to one third of the top of accepted papers to this special issue of the *Control and Cybernetics* journal. Revised and extended submissions were subject to the additional round of reviewing which led to the acceptance of nine papers from five different workshops. The workshop on GPUs in Databases (GID 2012) was chaired by Witold Andrzejewski (Poznan University of Technology, Poland), Krzysztof Kaczmarek (Warsaw University of Technology, Poland), and Tobias Lauer (Jedox AG, Germany). The motivation behind the workshop was the observation that while other application domains strongly benefit from utilizing the Graphics Processing Units (GPUs) to increase the performance of processing, the database-related applications and algorithms do not get sufficient attention. The main goal of GID 2012 was to fill this gap. The GID workshop contributed the paper "A framework for cost based optimization of hybrid CPU/GPU query plans in database systems" authored by Sebastian Breß, Ingolf Geist, Eike Schallehn, Maik Mory, and Gunter Saake.

The workshop entitled Ontologies meet Advanced Information Systems (OAIS'2012) was chaired by Ladjel Bellatreche (LIAS/ISAE-ENSMA, France)

and Yamine Ait Ameer (IRIT-ENSEEIH, France). The workshop had two main objectives. The first one was to present new and challenging issues in the contribution of ontologies to designing high quality information systems. The second one was to present new research and technological developments that use ontologies all over the life cycle of information systems. The OAIIS workshop contributed the following papers: "Introducing artificial neural network in ontologies alignment process" by Warith Eddine Djeddi and Mohamed Tarek Khadir and "Temporal reasoning in trajectories using an ontological modelling approach" by Jamal Malki, Rouaa Wannous, Alain Bouju, and Cécile Vincent.

The workshop on Modeling Multi-commodity Trade: Data models and processing (MMT'12) was chaired by Eugeniusz Toczyłowski (Warsaw University of Technology, Poland) and Mariusz Kaleta (Warsaw University of Technology, Poland). Its goal was to address the current scientific and technological challenges in information systems supporting the market mechanism, including: semantics issues in trading, architectures of information systems for market mechanisms, incorporating social networks into trade processes, data modeling for negotiations and bidding, as well as market process modeling and management. The MMT workshop contributed the following papers: "Balancing microgrid via programmable agents auctions" by Piotr Pałka, Weronika Radziszewska, and Zbigniew Nahorski, and "Bidding languages for auctions of divisible goods" by Mariusz Kaleta.

The workshop on Social Data Processing (SDP'12) was chaired by Jaroslav Pokorný (Charles University in Prague, Czech Republic), Athena Vakali (Aristotle University of Thessaloniki, Greece), and Václav Snášel (VSB - Technical University of Ostrava, Czech Republic). The workshop aimed at addressing the research issues associated with online social networks, including the topics of distributed computing, databases, and storage systems as well as modeling professional profiles of objects like workers, specialists, projects, supervisors, etc. The SDP workshop contributed the following papers: "Automatic wrapper generation and generalisation for social media websites" by Bartosz Baziński and Michał Brzezicki, and "Towards effective social network system implementation" by Jaroslav Škrabálek, Petr Kunc, Filip Nguyen, and Tomáš Pitner.

The workshop on Social and Algorithmic Issues in Business Support (SAIBS) was chaired by Adam Wojciechowski (Poznan University of Technology, Poland) and Alok Mishra (Atılım University, Turkey). The focus of the workshop was on computational and optimization issues that can be supported by crowd input or social intelligence. Specific goals included addressing the following problems: how far and in which fields business may benefit from utilizing social contribution, and how computer systems may understand social behavior and support humans in making decisions. The SAIBS workshop contributed the following papers: "Quantitative analysis of internet auctions advertising features: an empirical study" by Adam Wojciechowski and Paweł Warczyński, and "Community Traffic: a technology for the next generation car navigation" by Krzysztof Dembczyński, Przemysław Gawel, Andrzej Jaszkievicz, Wojciech Kotłowski,

Marek Kubiak, Robert Susmaga, Przemysław Wesolek, Adam Wojciechowski, and Piotr Zielniewicz.

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