FOREWORD

Ján PARALIČ

Department of Cybernetics and Artificial Intelligence
Technical University of Košice
Slovakia
e-mail: jan.paralic@tuke.sk

I am very glad that I can introduce this special issue of the Journal of Computing and Informatics. The contributions presented in this issue have been prepared by authors of the best papers presented at the conferences Znalosti (i.e. “Knowledge”) 2005 (Stará Lesná, Slovakia) and Znalosti 2006 (Hradec Králové, Czech Republic). Znalosti is a series of Czech and Slovak conferences devoted to knowledge acquisition, representation and exploitation. The conception of this conference series was a response to increasing interest in knowledge technologies in the Czech Republic and Slovakia, reflecting also the global research tendencies in the last couple of years.

Theoreticians and practitioners from originally disparate professional communities have already recognised this conference as an excellent opportunity for exchanging opinions and experience, and for establishing scientific cooperation in the knowledge-related research areas. An important point is the interdisciplinary nature of key topics of the conference. Knowledge discovery in databases and other information sources binds the domain of database information systems with those of decision support and scientific discovery. Methods of intelligent access to textual information and web sources combine the mathematical background of information retrieval with sophisticated methods of data representation and semantic models. Knowledge engineering is well on its way towards systematic application of computational logics on knowledge expressed in web-oriented languages.

In this issue a representative sample of the research topics listed above is covered by articles extending the best original conference contributions with the latest research results of their authors. All of these contributions have been afterwards rigorously reviewed by at least two reviewers.

The issue starts with the article by Ján Šefránek focused on approaches to theoretical investigation of dynamic aspects of knowledge representation, in particular evolving knowledge bases. Ján Šefránek considers the approaches characterized by the causal rejection principle (if there is a conflict between rules, then more preferred rules override those less preferred).
The next article co-authored by Kamil Matoušek, Martin Falc and Zdeněk Kouba moves towards knowledge representation that is typical for current state of the semantic web, i.e. ontologies. Kamil Matoušek et al. are focusing on temporal ontology for representing uncertainly specified time periods. For this purpose they combined mature approaches like Allen interval relations with introduction of time granularity concept and the concept of time uncertainty. They also present how the approaches have been successfully implemented in a particular application for the cultural heritage domain.

In the semantic web applications one of the challenges is how to compose simpler web services into custom applications for information requests in a heterogeneous and changing environment. Vojtěch Svátek, Miroslav Vacura, Martin Labský, and Anette Ten Teije in their article suggest using problem-solving methods as templates for composed services. They developed a multi-dimensional, ontology-based framework, and a collection of problem-solving methods, which enable to characterize deductive web mining applications at an abstract level and present also several existing applications in this framework.

The next article, co-authored by Katarína Matušíková and Mária Bieliková, deals with another very important problem of the open information space, namely personalized navigation. The authors present a method for personalized navigation based on social navigation where the information space is represented by ontology. The method comparing to existing approaches (navigating mostly in closed space) can withstand frequent information content changes and preserves gained navigational information despite these changes.

Next three articles are focused on various aspects of knowledge discovery. The article prepared by Kristína Machová, Peter Bednár and Marián Mach focuses on the field of automatic extraction of information from texts and text document categorisation including pre-processing of text documents, which can be found on the Internet. Kristína Machová et al. show how to increase the precision of categorisation by various techniques; they analyze the influence of unlabeled data with predicted categories on categorisation precision; they also show how to shorten the click streams needed to access a given web document and how to generate key words related with a web document.

In the following article Petr Berka, Jan Rauch and Marie Tomečková, organizers of Discovery Challenge at the European Conferences on Principles and Practice of Knowledge Discovery in Databases since 1999, summarize their experience gained when organizing and evaluating the Discovery Challenge on the atherosclerosis risk factor data. They show that knowledge discovery is a long, tedious process that requires cooperation of people from different areas. A success of this process depends on a number of factors, the most important being mentioned in their paper.

Finally, Jan Blažák and Lubomír Popelinský describe a system for distributed mining of first-order frequent patterns in horizontally partitioned data. The algorithm adopts the ideas of the well-known propositional algorithm Partition. The main advantages are its minimal communication overhead and the possibility to utilize any system for mining locally frequent patterns. The system has been shown to
be very useful for solving several data mining tasks, e.g. information extraction from biological texts, context-sensitive text correction or morphological disambiguation.

I would like to express my special thanks to all authors as well as reviewers who made this issue happen, but also to the Editorial Board of the journal Computing and Informatics for asking us to prepare such a special issue. I wish all the readers of this issue an interesting and worthwhile reading.

Ján Paralič received his Master degree in 1992 and his Ph. D. degree in 1998, both from the Technical University in Košice. Since 2004, he is associate professor at the Department of Cybernetics and Informatics, Technical University in Košice, and since 2005 also head of the Centre for Information Technologies at the same university. He (co-)authored two books, (co-) edited 10 proceedings from various international workshops and conferences, and published more than 70 scientific papers. His research interests currently are in the areas of knowledge discovery, text mining, semantic technologies, and knowledge management. He is member of the steering as well as program committee of the conference Znalosti (Knowledge) and he was the organizing chair of this conference in 2005 and programme committee chair in 2006, which have been the basis of this special issue.