

# Preface

This volume is devoted to advances in databases and information systems, one of the many active research areas in Computer Science within the broader field of Computing (or Informatics, as it is also called). The chapters in this monograph were actually papers on the program of the 6th Conference on Advances in Databases and Information Systems (ADBIS), held on September 8–11, 2002 in Bratislava, Slovakia.

The series of ADBIS Conferences is a successor of the annual international workshops under the same title, which were organized by the Moscow ACM SIGMOD Chapter during 1993–1996. In 1997, the 1st East European Conference on Advances in Databases and Information Systems was held in St. Petersburg, Russia, and the series was continued in Poznan, Poland in 1998, Maribor, Slovenia in 1999, Prague, Czech Republic in 2000, Vilnius, Lithuania in 2001, and now in Bratislava, Slovakia in 2002. The ADBIS Conference has become the premier event gathering researchers Central and Eastern Europe working in the area, providing an internationally recognized forum for presentation of their research results. More than that, the ADBIS conference has evolved into one of the important European conferences in the area, but also one which is attended by researchers from all over the world.

There is no better way to support the above statements than to give basic data about the ADBIS 2002 Conference. It was organized by the Slovak University of Technology (STU) in Bratislava (and, in particular, its Faculty of Electrical Engineering and Information Technology) in cooperation with the ACM SIGMOD, the Moscow ACM SIGMOD Chapter, and the Slovak Society for Computer Science. It attracted 115 submissions from 35 countries on all continents, alas, except Africa. The submissions were subject to a rigorous review process with each paper having been reviewed by three and sometimes even more referees. The ADBIS Conference is known for its continuous effort to set and comply with high quality standards with respect to the accepted papers. This makes the selection process even more difficult for the Program Committee (PC) and, eventually, the PC cochairs and volume editors, since many submitted papers could not be included in this volume, although they were considered as good ones in general. After many live and online discussions, 25 full papers and 4 short papers were accepted for inclusion in this volume, constituting the ADBIS 2002 Conference proceedings.

The high number of submissions is a clear sign that the ADBIS Conference series has acquired a worldwide interest and recognition. The authors of this volume come from 22 countries on four continents. Interestingly enough, Eastern Europe is no longer the most heavily represented region. This shows that while the ADBIS Conference maintains its focus, facilitating collaboration between researchers from that region and other parts of the world, it has also already become a fully international event that is standard by all the relevant criteria.

Besides these 29 regular papers, this volume includes also three invited papers that were presented at the conference as invited lectures. We are happy that we could include invited papers on such attractive topics in the area, as Web Site Modelling, Privacy and Security in ASP and Web Service Environments, and Infrastructure for Information Spaces, presented by very prominent authorities in the field. The conference program was complemented by two tutorials and several research communications.

We should like to thank:

- all the reviewers, and the PC members in particular, who made this volume and, in fact, the 2002 ADBIS Conference possible by volunteering to review in accordance with strict criteria of scientific merit;
- the Steering Committee of the ADBIS Conferences, and, in particular, its Chairman, Leonid Kalinichenko, for their guidance and advice;
- the Organizing Committee, and, in particular, its Chairwoman Maria Bielikova, for their very effective support in the technical preparation of this proceedings and in making the conference happen;
- Springer-Verlag for publishing these proceedings, and Alfred Hofmann, in particular, for effective support in producing them;
- last, but not least, the authors of the chapters in this volume, for contributing such excellent papers reporting their recent research results.

We hope that these proceedings will be useful to the researchers and academics that work in the area of Databases and Information Systems. Thus, we anticipate that in the future the interest of the research community in the ADBIS Conference series will continue to increase.

June 2002

Yannis Manolopoulos  
Pavol Návrát

# Organization

The Sixth Conference on Advances in Databases and Information Systems (ADBIS), held on September 8–11, 2002 in Bratislava, Slovakia, was organized by the Slovak University of Technology (and, in particular, its Faculty of Electrical Engineering and Information Technology) in Bratislava in cooperation with ACM SIGMOD, the Moscow ACM SIGMOD Chapter, and the Slovak Society for Computer Science.

## General Chair

Ludovít Molnár (Rector, Slovak University of Technology in Bratislava, Slovakia)

## Program Committee C-Chairs

Yannis Manolopoulos (Aristotle University of Thessaloniki, Greece)  
Pavol Návrat (Slovak University of Technology in Bratislava, Slovakia)

## Program Committee

Leopoldo Bertossi (Carleton University, Ottawa, Canada)  
Maria Bielikova (Slovak University of Technology in Bratislava, Slovakia)  
Omran A. Bukhres (Indiana University – Purdue University, Indianapolis, USA)  
Albertas Caplinskas (Inst. of Mathematics and Informatics, Vilnius, Lithuania)  
Wojciech Cellary (Poznan University of Economics, Poland)  
Bogdan Czejdo (Loyola University, New Orleans, USA)  
Marjan Druzovec (University of Maribor, Slovenia)  
Johann Eder (University of Klagenfurt, Austria)  
Heinz Frank (University of Klagenfurt, Austria)  
Remigijus Gustas (Karlstad University, Sweden)  
Tomas Hruska (Brno University of Technology, Czech Republic)  
Leonid Kalinichenko (Russian Academy of Sciences, Russia)  
Wolfgang Klas (University of Vienna, Austria)  
Matthias Klusch (German Research Center for Artificial Intelligence, Saarbrücken, Germany)  
Mikhail Kogalovsky (Russian Academy of Sciences, Russia)  
Karol Matiaso (University of Zilina, Slovakia)  
Mikhail Matskin (Norwegian Univ. of Science and Tech., Trondheim, Norway)  
Tomaz Mohoric (University of Ljubljana, Slovenia)  
Tadeusz Morzy (Poznan University of Technology, Poland)  
Nikolay Nikitchenko (National Taras Shevchenko University of Kiev, Ukraine)  
Boris Novikov (University of St. Petersburg, Russia)

Maria Orlowska (University of Queensland, Australia)  
Euthimios Panagos (AT&T Labs, USA)  
Oscar Pastor (Valencia University of Technology, Spain)  
Guenther Pernul (University of Essen, Germany)  
Jaroslav Pokorny (Charles University, Prague, Czech Republic)  
Henrikas Pranevichius (Kaunas University of Technology, Lithuania)  
Colette Rolland (Université Paris 1 Panthéon-Sorbonne, France)  
George Samaras (University of Cyprus, Nicosia, Cyprus)  
Klaus-Dieter Schewe (Massey University, New Zealand)  
Joachim W. Schmidt (Technical University Hamburg-Harburg, Germany)  
Timothy K. Shih (Tamkang University, China)  
Myra Spiliopolou (Leipzig Graduate School of Management, Germany)  
Julius Stuller (Academy of Sciences, Czech Republic)  
Bernhard Thalheim (Brandenburg University of Technology, Cottbus, Germany)  
Aphrodite Tsalgatidou (University of Athens, Greece)  
Vladimir Vojtek (Slovak University of Technology in Bratislava, Slovakia)  
Gottfried Vossen (University of Muenster, Germany)  
Benkt Wangler (University of Skoevde, Sweden)  
Tatjana Welzer (University of Maribor, Slovenia)  
Viacheslav Wolfengagen (Inst. for Contemporary Education, Moscow, Russia)  
Vladimir Zadorozhny (University of Pittsburgh, USA)  
Alexander Zamulin (Russian Academy of Sciences, Russia)

## Additional Reviewers

Eleni Berki	Torsten Priebe
Susanne Boll	Jarogniew Rykowski
Panagiotou Chirstoforos	Wasim Sadiq
Peter Dolog	Torsten Schlichting
Georgios Evangelidis	Krasten Schulz
Holger Grabow	Oleg Seleznev
Sebastian Graf	Mattias Strand
Birgit Hofreiter	Konrad Thalheim
Marcus Huetten	Yannis Theodoridis
Dimitrios Katsaros	Dimitrios Theotokis
Susanne Kjernald	Marek Trabalka
Christian Koncilia	Alexei Tretiakov
Zbyszko Krolikowski	Jose Maria
George Laskaridis	Turull Torres
Sebastian Link	Costas Vassilakis
Alexandros Nanopoulos	Michael Gr. Vassilakopoulos
Igor Nekrestyanov	Utz Westermann
Apostolos N. Papadopoulos	Wojciech Wiza
Ekaterina Pavlova	Marek Wojciechowski
Vicente Pelechano	Maciej Zakrzewicz

## Organizing Committee

### Chair

Mária Bieliková (Slovak University of Technology in Bratislava, Slovakia)

### Members

Peter Dolog (Slovak University of Technology in Bratislava, Slovakia)  
 Miroslav Galbavy (Slovak University of Technology in Bratislava, Slovakia)  
 Maria Hricova (Slovak University of Technology in Bratislava, Slovakia)  
 Tibor Krajcovic (Slovak University of Technology in Bratislava, Slovakia)  
 Alexandros Nanopoulos (Aristotle University of Thessaloniki, Greece)  
 Pavol Návrat (Slovak University of Technology in Bratislava, Slovakia)  
 Gabriela Polcicova (Slovak University of Technology in Bratislava, Slovakia)  
 Maria Smolarova (Slovak University of Technology in Bratislava, Slovakia)  
 Branislav Steigmüller (Slovak University of Technology in Bratislava, Slovakia)

## ADBIS Steering Committee

### Chair

Leonid Kalinichenko (Russia)

### Members

Andras Benczur (Hungary)	Rainer Manthey (Germany)
Radu Bercau (Romania)	Tadeusz Morzy (Poland)
Albertas Caplinskas (Lithuania)	Pavol Návrat (Slovakia)
Johann Eder (Austria)	Boris Novikov (Russia)
Janis Eiduks (Latvia)	Jaroslav Pokorný (Czech Republic)
Hele-Mai Haav (Estonia)	Boris Rachev (Bulgaria)
Mirjana Ivanovic (Yugoslavia)	Anatoly Stogny (Ukraine)
Mikhail Kogalovsky (Russia)	Tatjana Welzer (Slovenia)
Yannis Manolopoulos (Greece)	Viacheslav Wolfengagen (Russia)