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Yannis Manolopoulos  
Jaroslav Pokorný  
Timos Sellis (Eds.)

# Advances in Databases and Information Systems

10th East European Conference, ADBIS 2006  
Thessaloniki, Greece, September 2006  
Proceedings

 Springer

Yannis Manolopoulos Jaroslav Pokorný  
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# Advances in Databases and Information Systems

10th East European Conference, ADBIS 2006  
Thessaloniki, Greece, September 3 – 7, 2006  
Proceedings

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## Preface

The 10th East-European Conference on Advances in Databases and Information Systems was held on September 3-7, 2006, in Thessaloniki, Greece. It was organized by the Aristotle University of Thessaloniki, the University of Macedonia and the Alexander Technological Educational Institute of Thessaloniki.

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 ADBIS conferences provide an international platform for the presentation of research on database theory, development of advanced DBMS technologies, and their advanced applications.

The conference continued the long tradition of successful ADBIS conferences held in St. Petersburg (1997), Poznan (1998), Maribor (1999), Prague (2000), Vilnius (2001), Bratislava (2002), Dresden (2003), Budapest (2004) and Tallinn (2005). The conference included regular sessions with technical contributions reviewed and selected by an international Program Committee, as well as invited talks presented by leaders in their fields: Serge Abiteboul, Yannis Ioannidis and Pavel Zezula. ADBIS 2006 was also taken as an opportunity to host two other very popular events: the 2nd ADBIS Workshop on Data Mining and Knowledge Discovery (ADMKD) and the 5th Hellenic Data Management Symposium (HDMS).

ADBIS 2006 attracted 126 submissions from 36 countries from all over the world. This volume contains 29 high-quality papers selected during a rigorous reviewing process by an international Program Committee. The papers cover a wide range of topics of database and information systems research, all of them addressing hot research issues. A further 17 papers, which ranked top after the 29 papers presented in this volume, were accepted to be included in a separate volume of research communications published as a local volume of ADBIS 2006 proceedings, and published electronically in the CEUR Workshop Proceedings series at <http://ceur-ws.org/>.

Many people and organizations contributed to the success of ADBIS 2006. Our thanks go to the authors and invited speakers for their outstanding contribution to the conference and the proceedings. We are very grateful to the Program Committee members for their reviewing and for accepting a heavy workload. Our thanks go also to the additional referees who carefully reviewed the submissions. Without the willingness and enthusiasm of many scientists, who shared their expertise and voluntarily donated their time to thoroughly evaluating the merits of the work submitted, this conference would not have been possible.

We wish to thank all the members of the organizing team, as well as our sponsors, who made the conference possible. Our special thanks go to Apostolos

Papadopoulos and Konstantinos Tarabanis for their general organizational services, Antonis Sidiropoulos and the other members of the Data Eng. Lab of the Aristotle University for maintaining the ADBIS 2006 Web site, and Michalis Vassilakopoulos for the technical preparation of the conference proceedings. We are also grateful to Springer for supporting the publication of the ADBIS 2006 proceedings in their LNCS series. Finally, we would like to express our gratitude to our sponsors: the Ministry of National Education and Religious Affairs, and the IT companies: Altec and G-net.

This volume of proceedings is dedicated with loving memory to Radu Bercary and Alexander Zamulin, members of the ADBIS family, who passed away.

September 2006

Yannis Manolopoulos  
Jaroslav Pokorný  
Timos Sellis

## In Memory of Radu Bercaru and Alexandre Zamulin

**Radu Bercaru** was Scientific Director of the National Institute for R&D in Informatics (ICI), Bucharest, Romania, and Secretary of the ICI Scientific Council. He was member of the Program and Steering Committees of the ADBIS conferences. He was author/co-author of more than 40 papers published in national and international journals and proceedings. His areas of expertise were conceptual modelling, development of complex database systems, advanced databases, software engineering, national and international project management and consulting services, and team management in information systems development projects. His international experience consisted in local coordination of EU funded research projects and EU/ PHARE projects. In Romania, he was a member of the Evaluation Board for the Romanian Academy and Ministry of Education and Research Grants, of the Working Groups in charge of the Romanian Information Society Strategy, of the Steering Committee of the Romanian Conferences on Computer Science and Information Technologies, and other committees. He was also Director of the ICI R&D Program "Advanced Technologies and Systems for the Knowledge-Based Information Society". Radu Bercaru died in February 2005.

**Alexandre Zamulin** held several research positions at the Novosibirsk Branch of the Institute of Precise Mechanics and Computing Machines of the Academy of Sciences of the USSR (AS USSR), at the Computing Center of the Siberian Branch of the Academy of Sciences of the USSR (SB AS USSR) and at the Institute of Informatics Systems of the Siberian Branch of the Russian Academy of Sciences (IIS SB RAS). He was also Associate Professor of the Novosibirsk Electrotechnical Institute and Professor of the Novosibirsk State University, where he was head of the System Informatics chair in the Information Technologies Department. Moreover, Alexandre Zamulin was a member of the Inter-Departmental Commission on Databanks of the USSR State Research and Technology Committee, member of the Commission on Databanks of the AS USSR Coordinating Committee on Computing Machines and member of the Scientific Council and the Dissertation Council on physics and mathematics of the IIS SB RAS. Over a long period, he was a co-chair of the International Conference on Perspectives of System Informatics (PSI). For several years, he was a member of the Program Committee of the ADBIS conferences and contributed to ADBIS conferences with a number of articles. In the course of his scientific activities Alexandre Zamulin published over 100 works, including 2 monographs, devoted to the various aspects of constructing information systems, databases, programming languages, and specification languages. In recent years his chief scientific interests were connected with methods of algebraic specification of programming languages and databases. He was also a member of the editorial boards of many international editions. Alexandre Zamulin died in February 2006.

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# Data Ring: Let Us Turn the Net into a Database!

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**Abstract.** Because of information ubiquity, one observes an important trend towards transferring information management tasks from database systems to networks. We introduce the notion of Data Ring that can be seen as a network version of a database or a content warehouse. A main goal is to achieve better performance for content management without requiring the acquisition of explicit control over information resources. We discuss the main traits of Data Rings and argue that Active XML provides an appropriate basis for such systems.

The collaborating peers that form the Data Ring are autonomous, heterogeneous and their capabilities may greatly vary, e.g., from a sensor to a large database. To support effectively this paradigm of loose integration, the Data Ring enforces a seamless transition between data and metadata and between explicit and intentional data. It does not distinguish between data provided by web pages and data provided by web services, between local (extensional) data and external data obtained via a Web service call. This is achieved using the Active XML technology that is based on exchanging XML documents with embedded service calls both for the logical and physical data model.

# Future Data Management: “It’s Nothing Business; It’s Just Personal.”

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**Abstract.** Conventional data management occurs primarily in centralized servers or in well-interconnected distributed systems. These are removed from their end users, who interact with the systems mostly through static devices to obtain generic services around main-stream applications: banking, retail, business management, etc. Several recent advances in technologies, however, give rise to a new breed of applications, which change altogether the user experience and sense of data management. Very soon several such systems will be in our pockets, many more in our homes, the kitchen appliances, our clothes, etc. How would these systems operate? Many system and user aspects must be approached in novel ways, while several new issues come up and need to be addressed for the first time. Highlights include personalization, privacy, information trading, annotation, new interaction devices and corresponding interfaces, visualization, etc. In this talk, we take a close look at and give a very personal guided tour to this emerging world of data management, offering some thoughts on how the new technical challenges might be approached.