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Preface

The 20th East-European Conference on Advances in Databases and Information Systems (ADBIS 2016) took place in Prague, Czech Republic, during August 28–31, 2016. The ADBIS series of conferences aims at providing a forum for the dissemination of research accomplishments and at promoting 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. As such, ADBIS has created a tradition: its 20th anniversary edition in 2016 continued the series held in St. Petersburg (1997), Poznan (1998), Maribor (1999), Prague (2000), Vilnius (2001), Bratislava (2002), Dresden (2003), Budapest (2004), Tallinn (2005), Thessaloniki (2006), Varna (2007), Pori (2008), Riga (2009), Novi Sad (2010), Vienna (2011), Poznan (2012), Genoa (2013), Ohrid (2014), and Poitiers (2015). The conferences are initiated and supervised by an international Steering Committee consisting of representatives from Armenia, Austria, Bulgaria, Czech Republic, Cyprus, Estonia, Finland, France, Germany, Greece, Hungary, Israel, Italy, Latvia, Lithuania, FYR of Macedonia, Poland, Russia, Serbia, Slovakia, Slovenia, and the Ukraine.

The program of ADBIS 2016 included keynotes, research papers, thematic workshops, and a Doctoral Consortium. The conference attracted 85 paper submissions from 49 countries from all continents. After rigorous reviewing by the Program Committee (108 reviewers from 36 countries in the Program Committee and additionally by 31 external reviewers), the 21 papers included in this LNCS proceedings volume were accepted as full contributions, making an acceptance rate of 25 %. Springer sponsored the ADBIS 2016 best paper award. Furthermore, the Program Committee selected 11 more papers as short contributions. The authors of the ADBIS papers come from 33 countries. The two workshop organizations acted on their own and accepted seven papers for the BigDAP (37.7 acceptance rate) and DCSA (40 % acceptance rate) workshops and three for the Doctoral Consortium. The BigDAP and DCSA workshop had one invited paper each in order to enhance visibility and continuation. Short papers, workshop papers, and the special ADBIS history survey paper are published in a companion volume entitled *New Trends in Databases and Information Systems* in the Springer series *Communications in Computer and Information Science*. All papers were evaluated by at least three reviewers. The selected papers span a wide spectrum of topics in databases and related technologies, tackling challenging problems and presenting inventive and efficient solutions. In this volume, these papers are organized according to the nine sessions: (1) Database Theory and Access Methods, (2) User Requirements and Database Evolution, (3) Multidimensional Modeling and OLAP, (4) ETL, (5) Transformation, Extraction and Archiving, (6) Modeling and Ontologies, (7) Time Series Processing, (8) Performance and Tuning, (9) Advanced Query

Processing, (10) Approximation and Skyline, (11) Confidentiality and Trust. For this edition of ADBIS 2016, we had three keynote talks: the first one by Erhard Rahm from the University of Leipzig, Germany, on "The Case for Holistic Data Integration," the second one by Pavel Zezula from Masaryk University, Czech Republic, on "Similarity Searching for Database Applications," and the third one by Avigdor Gal, from Technion – Israel Institute of Technology, Israel, on "Big Data Integration."

The best papers of the main conference and workshops were invited to be submitted to special issues of the following journals: *Information Systems* and *Informatica*.

We would like to express our gratitude to every individual who contributed to the success of ADBIS 2016. Firstly, we thank all authors for submitting their research paper to the conference. However, we are also indebted to the members of the community who offered their precious time and expertise in performing various roles ranging from organizational to reviewing roles – their efforts, energy, and degree of professionalism deserve the highest commendations. Special thanks to the Program Committee members and the external reviewers for their support in evaluating the papers submitted to ADBIS 2016, ensuring the quality of the scientific program. We also offer thanks to all the colleagues, secretaries, and engineers involved in the conference and workshops organization, particularly Milena Zeithamlova (Action M Agency) for her endless help and support. A special thank you to the members of the Steering Committee, an in particular, its chair, Leonid Kalinichenko, and his vice chair, Yannis Manolopoulos, for all their help and guidance.

The conference would not have been possible without our supporters and sponsors: Faculty of Mathematics and Physics (Charles University in Prague), VSB – Technical University of Ostrava, Czech Society for Cybernetics and Informatics (CSKI), and the software companies Profinit, DCIT, and INTAX. Finally, we thank Springer for publishing the proceedings containing invited and research papers in the LNCS series. The Program Committee work relied on EasyChair, and we thank its development team for creating and maintaining it; it offered great support throughout the different phases of the reviewing process.

June 2016

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Big Data Integration (Abstract)

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Abstract. The evolution of data accumulation, management, analytics, and visualization has recently led to coining the term big data. Big data encompasses technological advancement such as Internet of things (accumulation), cloud computing (management), and data mining (analytics), packaging it all together while providing an exciting arena for new and challenging research agenda. In the light of these landscape changes we analyze in this talk the impact of big data on data integration, which involves the alignment of distributed, heterogeneous, and autonomously evolving data. Big data integration is about matching social media with sensor data, putting it into use in applications such as smart city, health informatics, etc. In particular, the talk will present advancement in automatic tools for data integration and the changing role of human experts.

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