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New Trends in Databases and Information Systems

ADBIS 2016 Short Papers and Workshops, BigDap, DCSA, DC
Prague, Czech Republic, August 28–31, 2016
Proceedings

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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 ADBIS 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.

This volume contains 11 papers selected as short contributions to be presented at the ADBIS conference as well as papers contributed by two associated satellite events and a Doctoral Consortium. Each of the satellite events and Doctoral Consortium complementing the main ADBIS conference had its own international Program Committee, whose members served as the reviewers of papers included in this volume. The volume is divided into four parts, one devoted to ADBIS short contributions and each other part to a single satellite event and Doctoral Consortium.

This volume also contains a survey on the ADBIS history written by Theodora Tsikrika and Yannis Manolopoulos. ADBIS has had a pre-history in the East–West symposia and symposia of the ACM SIGMOD Chapter in Moscow. The ADBIS conference series is now 20 years old and can be considered one of the most established and well-recognized conferences in the field of database and information systems technology, theory, practice, and modeling. Although in the beginning the conference was an East–West forum, it has now become a worldwide conference. ADBIS has not focused on specific sub-areas of database and information systems research.

The selected short papers span a wide spectrum of topics related to the ADBIS conference. Most of them are related to database and information systems technology for advanced applications. Typical applications are big data, multidimensional data, novel data store techniques, streaming databases, NoSQL applications, crowdsourcing support systems, data integration and evolution, user-oriented systems, and data warehouses.

The workshop co-chairs Barbara Catania and Klaus-Dieter Schewe selected three of the submitted workshop proposals for ADBIS 2016 with the condition that each

of the workshops would have at least six submissions. Two workshops met this condition. One workshop got cancelled.

The Third International Workshop on Big Data Applications and Principles (BigDap 2016) was organized by Tania Cerquitelli (Politecnico di Torino, Italy), Elena Baralis (Politecnico di Torino, Italy), and Pietro Michiardi (EURECOM, France).

In the last few years, a variety of modern applications, e.g., computer network traffic, smart cities, e-commerce, social networks, are able to generate data at an unprecedented rate, to such an extent that data rapidly scale toward big data. These large data volumes provide an unprecedented opportunity to tackle interesting research challenges so as to add intelligence in real-world applications. The importance of effectively and efficiently dealing with big data collections is revealed by the growing number of companies engaged in the field.

The BigDap 2016 workshop included a keynote presentation held by Marco Mellia on the design and investigation of energy-efficient networks (green networks) and in traffic monitoring and analysis. The Internet is based on decentralization and diversity and its distributed nature leads to operational brittleness and difficulty in identifying the root causes of performance degradation. In such a context, network measurements are a fundamental pillar for shedding light and unveiling design and implementation defects. The mPlane runs, collects, and analyzes traffic measurements to study the operation and functioning of the Internet. The potentiality of the mPlane approach to unveil network and service degradation issues in live and operational networks is discussed.

The workshop included an invited paper (Garza et al.) and three selected research papers (Ordozgoiti et al., Venturini et al., Zhu and Mozo). In the invited paper, a context-aware personalization approach is proposed to efficiently address the information overload issue. Data mining algorithms have been exploited to automatically infer contextual views over a relational database.

The three selected papers address different interesting research issues related to innovative algorithms on big data management and analysis. An unsupervised feature selection algorithm, based on data orthogonal transformations together with rank revealing matrix factorizations, was proposed by Ordozgoiti et al. to efficiently perform cluster analysis on large data collections. A novel distributed associative classifier (named BAC), based on ensemble techniques, was presented by Venturini et al. BAC, designed and developed on the Apache Spark framework, building a variety of models on different subsets of the original dataset and exploiting a voting strategy to provide a unique classification outcome. Zhu and Mozo proposed the Spark2Fires algorithm to efficiently perform subspace clustering on large data sets. The corresponding Apache Spark implementation was evaluated and discussed.

The Second Workshop on Data-Centered Smart Applications (DCSA 2016) sought to bring together computer science and information systems experts, and more precisely data scientists, involved in smart applications engineering. Massive data collections and the usage of that data for smart applications has become key to the process of improving the efficiency, reliability, and security of a traditional application. There are many issues that should be taken into consideration as the first step: (a) modeling, analytics and design of data and smart applications; (b) metadata, ontologies, vocabularies perspectives; (c) Semantic Web for smart applications; (d) applications of existing technologies, etc. The classic approach where people had to learn how

equipment can be used is no longer appropriate. Applications are only accepted if they are natural to the users. In the past, researchers tried participatory design based on some knowledge of the main users, their way of operating systems, and their main desires and demands. This research and technology development must be extended by tools that can be used in an intuitive way, within many different cultures, within a variety of deployment scenarios, within a group of people deploying the techniques, within different collaboration scenarios, and within different levels of attention.

Applications should be flexible to use and provide features for intelligent extraction of essential data within a given scope. Intelligent extraction of essential data and interpreting these data in a proper way is still a challenge. The invited paper (Martinez-Gil et al.) introduces such features based on a case study in a human resource management application. Smart applications must also be adaptable to the culture of the users despite their development for completely different environments. The four accepted papers were selected from ten submissions and span topics such as modeling of smart applications and modeling for collaborations, adaptation of services to cultures, and smart systems for extreme disastrous situations. E. Alsabi et al. discuss how smart applications are often developed for mobile applications and require novel development methods, e.g., on the basis of design science. Smart applications require robustness of data management also in the case that some of the data are uncertain, incomplete, or problematic. In a case study reported by K. Honda and N. Yoshida, it is shown how such data can be enhanced through integration with high-quality data. Applications have to support collaboration among users and among systems. Model-based multi-party collaboration is the topic of the paper by M. Tropmann-Frick et al. It supports applications that use a variety of models and systems. R. Ehaidid et al. show how smart applications can also be adapted to the culture of users despite their development for completely different environments.

The ADBIS Doctoral Consortium (ADBIS DC 2016) was a forum for PhD students to present their research ideas, discuss them with the scientific community, receive feedback from senior mentors, socialize, and form cooperation networks. With this purpose, the ADBIS main conference and workshops were open to ADBIS DC 2016 participants. The DC organizers chose three papers in the final selection. Their authors are Jiri Sebek and Karel Richta from the Czech Republic, Ondrej Kassak, Michal Kompan, and Maria Bielikova from Slovakia, and Stanislav Makarov from Russia. The topics of the DC were on “Adaptive Application Structure Using the Aspect-Oriented Approach,” “Short-Term User Behavior Changes Modeling,” “Framework for Managing Distinct Versions of Data in Relational Databases,” respectively.

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 papers 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 go 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 thank 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, and in particular, its chair, Leonid Kalinichenko, and vice chair, Yannis Manolopoulos, for all their help and guidance.

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Finally, we thank Springer for publishing the proceedings containing invited and research papers in the CCIS 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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