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Editors


# New Trends in Database and Information Systems


ADBIS 2023 Short Papers, Doctoral Consortium and Workshops:  
AIDMA, DOING, K-Gals, MADEISD, PeRS, Barcelona, Spain  
September 4–7, 2023, Proceedings


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ISSN 1865-0929

ISSN 1865-0937 (electronic)

Communications in Computer and Information Science

ISBN 978-3-031-42940-8

ISBN 978-3-031-42941-5 (eBook)

<https://doi.org/10.1007/978-3-031-42941-5>

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# Preface

This CCIS volume includes research papers from the 27th European Conference on Advances in Databases and Information Systems - ADBIS, research papers from workshops accompanying ADBIS, and research papers from the PhD consortium.

The 27th ADBIS conference was held in Barcelona, Spain, on September 4–7, 2023, as a full on-site event. It received significant attention from both the research and industrial communities. A total of 77 papers were submitted to the conference, 14 of which were accepted as long papers, appearing in the LNCS proceedings volume of the conference. The papers were reviewed by an international Program Committee constituted of 96 members.

This CCIS volume includes 25 papers from the main ADBIS Conference, at an acceptance rate of 39% (25/63). These papers cover the following topics: Data Integration, Data Quality, Consistent Data Management, Metadata Management, Index Management, Query Processing, Temporal Graphs, Data Science, and Fairness.

This volume includes also the papers accepted at five workshops which were co-located with ADBIS 2023. Each workshop had its own international program committee, whose members served as the reviewers of the workshop papers included in this volume. The maximum paper acceptance rate at each of these events did not exceed 50%. In total, 63 papers were submitted to these workshops, out of which 29 were selected for presentation at the conference and publication in this volume, giving an overall acceptance rate of 46%.

The following workshops were run at the ADBIS 2023 conference.

*AIDMA: 1st Workshop on Advanced AI Techniques for Data Management and Analytics*, chaired by Allel Hadjali (Engineer School ENSMA, France), Anton Dignös (Free University of Bozen-Bolzano, Italy), Danae Pla Karidi (Athena Research Center, Greece), Fabio Persia (University of L'Aquila, Italy), George Papastefanatos (Athena Research Center, Greece), Giancarlo Sperli (University of Naples "Federico II", Italy), Giorgos Giannopoulos (Athena Research Center, Greece), Julien Aligon (Toulouse 1 Capitole University, France), Manolis Terrovitis (Athena Research Center, Greece), Nicolas Labroche (University of Tours, France), Paul Monsarrat (RESTORE, France), Richard Chbeir (University of Pau and the Adour Region, France), Sana Sellami (Aix-Marseille University, France), Seshu Tirupathi (IBM Research Europe), Torben Bach Pedersen (Aalborg University, Denmark), and Vincenzo Moscato (University of Naples "Federico II", Italy). Artificial Intelligence (AI) methods are now well established and have been fully integrated by the data management and analytics (DMA) community as an innovative way to address some of its challenges in different application domains. The AIDMA workshop fully embraced this new trend in data management and analytics. The workshop aimed to gather researchers from Artificial Intelligence, data management, and analytics to address the new challenges in a variety of application domains.

*DOING: 4th Workshop on Intelligent Data – from Data to Knowledge*, chaired by Mirian Halfeld-Ferrari (Université d’Orléans, France) and Carmem S. Hara (Universidade Federal do Parana, Brazil). Texts are an important source of information and communication in diverse domains. The intelligent, efficient, and secure use of this information requires, in most cases, the transformation of unstructured textual data into data sets with some structure and organized according to an appropriate schema that follows the semantics of an application domain. In this context, the workshop focused on transforming data into information and then into knowledge, focusing on data related to health and environmental domains. The main aim was to gather researchers in NLP (Natural Language Processing), DB (Databases), and AI (Artificial Intelligence) to discuss two main problems: (1) how to extract information from textual data and represent it in knowledge bases and (2) how to propose intelligent methods for handling and maintaining these databases with new forms of requests.

*K-Gals: 2nd International Workshop on Knowledge Graphs Analysis on a Large Scale*, chaired by Mariella Bonomo (University of Palermo, Italy) and Simona E. Rombo (University of Palermo, Italy). Knowledge graphs are powerful models to represent networks of real-world entities, such as objects, events, situations, and concepts, by illustrating their relationships. This workshop aimed to provide an opportunity to introduce and discuss new methods, theoretical approaches, algorithms, and software tools that are relevant for research on Knowledge Graphs in general and on a large scale in particular. Specific topics included how Knowledge Graphs can be used to represent knowledge, how systems managing Knowledge Graphs work, and which applications may be provided on top of a Knowledge Graph.

*MADEISD: 5th Workshop on Modern Approaches in Data Engineering and Information System Design*, chaired by Ivan Luković (University of Belgrade, Serbia), Slavica Kordić (University of Novi Sad, Serbia), and Sonja Ristić (University of Novi Sad, Serbia). How to support information management processes in order to produce useful knowledge and tangible business value from collected data is still an open issue in many organizations. One of the central roles in addressing this issue is played by databases and information systems. In this context, the goal of this workshop was to address open questions regarding data engineering and information system design for the development and implementation of effective software services in support of information management and data-driven decision making in various organization systems.

*PeRS: 2nd Workshop on Personalization and Recommender Systems*, chaired by Marek Grzegorowski (University of Warsaw, Poland), Aleksandra Karpus (Gdańsk University of Technology, Poland), Tommaso di Noia (Politecnico University of Bari, Italy), and Adam Przybyłek (Gdańsk University of Technology, Poland). Recommender systems are present in our everyday lives when we read news, log in to social media, or buy something in an e-shop. Closely related to Recommender Systems is User Modelling since it enables personalization as an essential aspect of novel recommendation techniques. In a broader sense, user representation, personalized search, adaptive educational systems, and intelligent user interfaces are also related. In this context, the aim of this workshop was to extend the state of the art in User Modelling and Recommender Systems by providing a platform where industry practitioners and academic researchers can meet and learn from each other.

This volume also includes student papers accepted at the *Doctoral Consortium* (DC). The ADBIS 2023 DC was a forum for PhD students to present their research projects to the scientific community. DC papers describe the status of a PhD student's research, a comparison with relevant related work, their results, and plans on how to experiment, validate, and consolidate their contribution. The DC allowed PhD students to establish international collaborations with members of the ADBIS community and conference participants. The ADBIS 2023 DC received 22 papers, evaluated through a selective peer-review process by an international program committee. After a thorough evaluation, 10 papers were selected for presentation and 8 of these are included in this volume, giving an overall acceptance rate of 45%. The ADBIS 2023 DC program also included a panel about the meaning of success in scientific careers with accomplished professionals in academia, industry, and entrepreneurship. Finally, recognizing the importance of Diversity and Inclusion (D&I), according to the initiative promoted by the conference, the DC organized a data-driven activity to create inclusion awareness in research together with the D&I conference program. The PhD consortium was chaired by Genevieve Vargas Solar (French Council of Scientific Research, France) and Ester Zumpano (University of Calabria, Italy).

Comprehensive information about ADBIS 2023 and all its accompanying events is available at <https://www.essi.upc.edu/dtim/ADBIS2023/index.html>. This web page is also available from the official ADBIS portal - <http://adbis.eu>, which provides up-to-date information on all ADBIS conferences, persons in charge, tutorials and keynotes, publications, and issues related to the ADBIS community.

**ADBIS history in a nutshell.** The first ADBIS Conference was held in Saint Petersburg, Russia (1997). Since then, ADBIS has been continuously organized as an annual event. Its previous editions were held in: Poznan, Poland (1998); Maribor, Slovenia (1999); Prague, Czech Republic (2000); Vilnius, Lithuania (2001); Bratislava, Slovakia (2002); Dresden, Germany (2003); Budapest, Hungary (2004); Tallinn, Estonia (2005); Thessaloniki, Greece (2006); Varna, Bulgaria (2007); Pori, Finland (2008); Riga, Latvia (2009); Novi Sad, Serbia (2010); Vienna, Austria (2011); Poznan, Poland (2012); Genoa, Italy (2013); Ohrid, North Macedonia (2014); Poitiers, France (2015); Prague, Czech Republic (2016); Nicosia, Cyprus (2017); Budapest, Hungary (2018); Bled, Slovenia (2019); Lyon, France (2020); Tartu, Estonia (2021); and Turin, Italy (2022).

**Acknowledgements.** We would like to wholeheartedly thank all participants, authors, PC members, workshop organizers, session chairs, doctoral consortium chairs, workshop chairs, volunteers, and co-organizers for their contributions in making ADBIS

2023 a great success. We would also like to thank the ADBIS Steering Committee and all sponsors.

July 2023

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# Contents

## Index Management and Data Reconstruction

Estimating <i>i</i> SAX Parameters for Efficiency .....	3
<i>Mihalis Tsoukalos, Nikos Platis, and Costas Vassilakis</i>	
RILCE: Resource Indexing in Large Connected Environments .....	13
<i>Fouad Achkouty, Elio Mansour, Laurent Gallon, Antonio Corral, and Richard Chbeir</i>	

## Query Processing

A Cost-Effective Query Optimizer for Multi-tenant Parallel DBMSs .....	25
<i>Mira El Danaoui, Shaoyi Yin, Abdelkader Hameurlain, and Franck Morvan</i>	
Video Situation Monitoring to Improve Quality of Life .....	35
<i>Hafsa Billah, Abhishek Santra, and Sharma Chakravarthy</i>	
Remembering the Forgotten: Clustering, Outlier Detection, and Accuracy Tuning in a Postdiction Pipeline .....	46
<i>Anna Baskin, Scott Heyman, Brian T. Nixon, Constantinos Costa, and Panos K. Chrysanthis</i>	

## Advanced Querying Techniques

Diversification of Top-k Geosocial Queries .....	59
<i>Hassan Abedi Firouzjaei, Dhruv Gupta, and Kjetil Nørnvåg</i>	
Multi-disciplinary Research: Open Science Data Lake .....	71
<i>Vincent-Nam Dang, Nathalie Aussenac-Gilles, and Franck Ravat</i>	
Be High on Emotion: Coping with Emotions and Emotional Intelligence when Querying Data .....	82
<i>Sandro Bimonte, Patrick Marcel, and Stefano Rizzi</i>	

## Fairness in Data Management

Exploring Biases for Privacy-Preserving Phonetic Matching .....	95
<i>Alexandros Karakasidis and Georgia Koloniari</i>	

<b>Multi-Objective Fairness in Team Assembly</b> .....	106
<i>Rodrigo Borges, Otto Sahlgrens, Sami Koivunen, Kostas Stefanidis, Thomas Olsson, and Arto Laitinen</i>	
 <b>Data Science</b>	
<b>A Comparative Study of Assessment Metrics for Imbalanced Learning</b> .....	119
<i>Zakarya Farou, Mohamed Aharrat, and Tomáš Horváth</i>	
<b>A Hybrid GNN Approach for Predicting Node Data for 3D Meshes</b> .....	130
<i>Shwetha Salimath, Francesca Bugiotti, and Frédéric Magoules</i>	
<b>Transformers and Attention Mechanism for Website Classification and Porn Detection</b> .....	140
<i>Lahcen Yamoun, Zahia Guessoum, and Christophe Girard</i>	
<b>Analysing Robustness of Tiny Deep Neural Networks</b> .....	150
<i>Hamid Mousavi, Ali Zoljodi, and Masoud Daneshtalab</i>	
 <b>Temporal Graph Management</b>	
<b>Semantic Centrality for Temporal Graphs</b> .....	163
<i>Landy Andriamampianina, Franck Ravat, Jiefu Song, and Nathalie Vallès-Parlangeau</i>	
<b>A Knowledge Graph for Query-Induced Analyses of Hierarchically Structured Time Series Information</b> .....	174
<i>Alexander Graß, Christian Beecks, Sisay Adugna Chala, Christoph Lange, and Stefan Decker</i>	
 <b>Consistent Data Management</b>	
<b>Eventually-Consistent Replicated Relations and Updatable Views</b> .....	187
<i>Joachim Thomassen and Weihai Yu</i>	
<b>Mining Totally Ordered Sequential Rules to Provide Timely Recommendations</b> .....	197
<i>Anna Dalla Vecchia, Niccolò Marastoni, Sara Migliorini, Barbara Oliboni, and Elisa Quintarelli</i>	



## Data Integration

Streaming Approach to Schema Profiling .....	211
<i>Chiara Forresi, Matteo Francia, Enrico Gallinucci, and Matteo Golfarelli</i>	
Using ChatGPT for Entity Matching .....	221
<i>Ralph Peeters and Christian Bizer</i>	
CONSchema: Schema Matching with Semantics and Constraints .....	231
<i>Kevin Wu, Jing Zhang, and Joyce C. Ho</i>	

## Data Quality

Context-Aware Data Quality Management Methodology .....	245
<i>Flavia Serra, Veronika Peralta, Adriana Marotta, and Patrick Marcel</i>	
Thesaurus-Based Transformation: A Classification Method for Real Dirty Data .....	256
<i>Maxime Perrot, Mickaël Baron, Brice Chardin, and Stéphane Jean</i>	

## Metadata Management

Mobile Feature-Oriented Knowledge Base Generation Using Knowledge Graphs .....	269
<i>Quim Motger, Xavier Franch, and Jordi Marco</i>	
NoSQL Schema Extraction from Temporal Conceptual Model: A Case for Cassandra .....	280
<i>Maryam Mozaffari, Anton Dignös, Hind Hamrouni, and Johann Gamper</i>	

## Contributions from ADBIS 2023 Workshops and Doctoral Consortium

Databases and Information Systems: Contributions from ADBIS 2023 Workshops and Doctoral Consortium .....	293
<i>Adam Przybytek, Aleksandra Karpus, Allel Hadjali, Anton Dignös, Carmem S. Hara, Danae Pla Karidi, Ester Zumpano, Fabio Persia, Genoveva Vargas-Solar, George Papastefanatos, Giancarlo Sperli, Giorgos Giannopoulos, Ivan Luković, Julien Aligon, Manolis Terrovitis, Marek Grzegorowski, Mariella Bonomo, Mirian Halfeld Ferrari, Nicolas Labroche, Paul Monsarrat, Richard Chbeir, Sana Sellami, Seshu Tirupathi, Simona E. Rombo, Slavica Kordić, Sonja Ristić, Tommaso Di Noia, Torben Bach Pedersen, and Vincenzo Moscato</i>	

**AIDMA: 1st Workshop on Advanced AI Techniques for Data Management, Analytics**

Data Exploration Based on Local Attribution Explanation: A Medical Use Case ..... 315  
*Elodie Escriva, Emmanuel Doumard, Jean-Baptiste Excoffier, Julien Aligon, Paul Monsarrat, and Chantal Soulé-Dupuy*

Explainability Based on Feature Importance for Better Comprehension of Machine Learning in Healthcare ..... 324  
*Pronaya Prosun Das, Lena Wiese, and ELISE STUDY GROUP*

An Empirical Study on the Robustness of Active Learning for Biomedical Image Classification Under Model Transfer Scenarios ..... 336  
*Tamás Janusko, Julius Gonsior, and Maik Thiele*

Evaluating the Robustness of ML Models to Out-of-Distribution Data Through Similarity Analysis ..... 348  
*Joakim Lindén, Håkan Forsberg, Masoud Daneshthalab, and Ingemar Söderquist*

Holistic Analytics of Sensor Data from Renewable Energy Sources: A Vision Paper ..... 360  
*Søren Kejser Jensen and Christian Thomsen*

**DOING: 4th Workshop on Intelligent Data - From Data to Knowledge**

Labeling Portuguese Man-of-War Posts Collected from Instagram ..... 369  
*Heloisa Fernanda Rocha, Lorena Silva Nascimento, Leonardo Camargo, Mauricio Noernberg, and Carmem S. Hara*

Semantic Business Trajectories Modeling and Analysis ..... 382  
*Muhammad Arslan and Christophe Cruz*

A Text Mining Pipeline for Mining the Quantum Cascade Laser Properties .... 393  
*Deperias Kerre, Anne Laurent, Kenneth Maussang, and Dickson Owuor*

Ensemble Learning Based Quantum Text Classifiers ..... 407  
*Yousra Bouakba and Hacene Belhadef*

Exploring the Capabilities and Limitations of VQC and QSVC for Sentiment Analysis on Real-World and Synthetic Datasets ..... 415  
*Hacene Belhadef, Hala Benchiheb, and Lynda Lebdejiri*

## **K-Gals: 2nd Workshop on Knowledge Graphs Analysis on a Large Scale**

P2KG: Declarative Construction and Quality Evaluation of Knowledge Graph from Polystores .....	427
<i>Xiuwen Zheng, Subhasis Dasgupta, and Amarnath Gupta</i>	
Using Knowledge Graphs to Model Green Investment Opportunities .....	440
<i>Giorgio Grani, Lorenzo Di Rocco, and Umberto Ferraro Petrillo</i>	
Knowledge Graphs Embeddings for Link Prediction in the Context of Sustainability .....	452
<i>Ylenia Galluzzo and Francesco Gennusa</i>	
An ArchiMate-Based Thematic Knowledge Graph for Low-Code Software Development Domain .....	465
<i>Karlis Rokis and Marite Kirikova</i>	
A Knowledge Graph to Analyze Clinical Patient Data .....	477
<i>Mariella Bonomo, Francesco Ippolito, and Salvatore Morfea</i>	

## **MADEISD: 5th Workshop on Modern Approaches in Data Engineering, Information System Design**

Towards Automatic Conceptual Database Design Based on Heterogeneous Source Artifacts .....	487
<i>Goran Banjac, Drazen Brdjanin, and Danijela Banjac</i>	
Lightweight Aspect-Oriented Software Product Lines with Automated Product Derivation .....	499
<i>Jakub Perdek and Valentino Vranić</i>	
Comparison of Selected Neural Network Models Used for Automatic Liver Tumor Segmentation .....	511
<i>Dominik Kwiatkowski and Tomasz Dziubich</i>	
Intelligent Index Tuning Using Reinforcement Learning .....	523
<i>Michał Mateczak and Tomasz Czocharński</i>	
Automatic Indexing for MongoDB .....	535
<i>Lucia de Espona Pernas, Anton Vichalkovski, William Steingartner, and Ela Pustulka</i>	

From High-Level Language to Abstract Machine Code: An Interactive Compiler and Emulation Tool for Teaching Structural Operational Semantics .....	544
<i>William Steingartner and Igor Sivý</i>	

Decentralised Solutions for Preserving Privacy in Group Recommender Systems .....	552
<i>Marina Paldauf</i>	

**PeRS: 2nd Workshop on Personalization, Recommender Systems**

A Recommendation System for Personalized Daily Life Services to Promote Frailty Prevention .....	563
<i>Ghassen Frikha, Xavier Lorca, Hervé Pingaud, Adel Taweel, Christophe Bortolaso, Katarzyna Borgiel, and Elyes Lamine</i>	

Design-Focused Development of a Course Recommender System for Digital Study Planning .....	575
<i>Michaela Ochs, Tobias Hirmer, Katherina Past, and Andreas Henrich</i>	

Systematic Literature Review on Click Through Rate Prediction .....	583
<i>Paulina Leszczyłowska, Maria Bollin, and Marcin Grabski</i>	

Overcoming the Cold-Start Problem in Recommendation Systems with Ontologies and Knowledge Graphs .....	591
<i>Stanislav Kuznetsov and Pavel Kordík</i>	

Recommender Chatbot as a Tool for Collaborative Business Intelligence in Tourism Domain .....	604
<i>Olga Cherednichenko and Fahad Muhammad</i>	

Neural Graph Collaborative Filtering: Analysis of Possibilities on Diverse Datasets .....	612
<i>Dariusz Kobiela, Jan Groth, Michał Sieńczyński, Rafał Wolniak, and Krzysztof Pastuszek</i>	

Performance and Reproducibility of BERT4Rec .....	620
<i>Aleksandra Gałka, Jan Grubba, and Krzysztof Walentukiewicz</i>	

**Doctoral Consortium**

Towards Reliable Machine Learning .....	631
<i>Simona Nisticò</i>	

Tackling the RecSys Side Effects via Deep Learning Approaches ..... 639  
*Erica Coppolillo*

Towards a Researcher-in-the-loop Driven Curation Approach  
for Quantitative and Qualitative Research Methods ..... 647  
*Alejandro Adorjan*

Deep Learning Techniques for Television Broadcast Recognition ..... 656  
*Federico Candela*

Process Mining Solutions for Public Administration ..... 668  
*Simona Fioretto*

Intelligent Technologies for Urban Progress: Exploring the Role of AI  
and Advanced Telecommunications in Smart City Evolution ..... 676  
*Enea Vincenzo Napolitano*

Automatic Discovery of Zones of Interests with Maritime Trajectory  
Mining ..... 684  
*Omar Ghannou*

**Author Index** ..... 693