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Preface

This volume contains the papers presented at ISMIS 2014: 21st International Symposium on Methodologies for Intelligent Systems held during June 25–27, 2014, in Roskilde, Denmark. The symposium was organized by members of the PLIS research group: Programming, Logic and Intelligent Systems, of the Department of Communication, Business and Information Technologies at Roskilde University.

ISMIS is a conference series that started in 1986 and has developed into an established and prestigious conference for exchanging the latest research results in building intelligent systems. The scope of ISMIS represents a wide range of topics on applying artificial intelligence techniques to areas as diverse as decision support, automated deduction, reasoning, knowledge-based systems, machine learning, computer vision, robotics, planning, databases, information retrieval, and so on. ISMIS provides a forum and a means for exchanging information for those interested purely in theory, those interested primarily in implementation, and those interested in specific research and industrial applications.

We want to express our special thanks to the Program Committee members and everyone who contributed at any level to the organization of ISMIS 2014. Also, special thanks to our invited speakers, Matthias Jarke, Xavier Serra and Steffen Staab. We would like to thank every author who submitted a paper to ISMIS 2014 and finally the team of EasyChair, without whose free software the handling of submissions and editing of the proceedings could not have been managed so smoothly by a small group of people. Last but not the least, we thank Alfred Hofmann of Springer for his continuous support.

April 2014

Troels Andreasen
Henning Christiansen
Juan-Carlos Cubero
Zbigniew W. Raś

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The symposium was organized by members of the PLIS research group: Programming, Logic and Intelligent Systems, of the Department of Communication, Business and Information Technologies at Roskilde University.

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Invited Talks

Exploiting Cultural Specificity in Music Information Research

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Music Information Research (MIR) is a discipline that aims to understand and model music from an information processing perspective and one of its major challenges relates to the automatic generation of musically meaningful information with which to better describe and exploit audio music recordings. The goal is to integrate and process a variety of data sources, like the actual audio recordings, plus editorial metadata and contextual information, to obtain structured information that is semantically and musically meaningful and that is of use in search, retrieval and discovery tasks [1].

A piece of music is an information entity that makes sense specially within a particular social and cultural context. Its analysis and description has to take that into account and thus the data-driven approaches have to incorporate domain knowledge from that particular context in order to make sense of the available information on that piece of music.

In this presentation I will introduce the research currently being done in CompMusic (http://compmusic.upf.edu), a project funded by the European Research Council that focuses on a number of MIR problems through the study of five music cultures: Hindustani (North India), Carnatic (South India), Turkish-makam (Turkey), Arab-Andalusian (Maghreb), and Beijing Opera (China). We work on the extraction of musically relevant features from audio music recordings related to melody and rhythm, and on the semantic analysis of the contextual information of those recordings [2].

Given that most of the research in MIR has been based on studying the western commercial music of the last few decades, our claim is that the technologies developed have a strong bias towards that music, thus not being appropriate for other music repertories. We want to identify the current limitations and propose information processing approaches that can go beyond those boundaries. For that we selected a few music cultures that had personalities contrasting with the popular western music, that had alive performance practices and strong social and cultural relevance, for which there were musicological and cultural studies, and for which it was feasible to collect sufficient and coherent machine-readable

music data. At the same time we wanted to have a diverse set of music repertoires with which to study a variety of new and diverse MIR problems.

A major effort in CompMusic has been the creation of research corpora. The types of data that we have gathered are mainly audio recordings and editorial metadata, which are then complemented with descriptive information about the items we have, and in some cases with music scores and/or lyrics. In order to evaluate our research results we have defined a user scenario and have developed a complete system-level application with which users can interact and with which we can evaluate most of the research results from a user perspective. The system, Dunya (http://dunya.compmusic.upf.edu), is a web-based application to explore music collections aimed at music connoisseurs of the particular music traditions. It uses the technologies developed for melodic and rhythmic description and semantic analysis to navigate through the audio recordings and the information items available. This navigation promotes the discovery of relationships between the different information items.

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Big Data Workflows: Issues and Challenges

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Abstract. Big Data is often seen as a rather uniform, if not well understood conglomerate of research and practice issues related to massively increased Volume, Velocity, and Variety of data. In reality, there is an enormous diversity of requirements, architectural and algorithmic settings, in which key success factors can range from efficient sensor fusion to rapid query processing and stream mining, to careful semantic-preserving data integration, to aspect such as data protection, provenance maintenance, novel business models, and digital rights management. In the Fraunhofer Big Data [1], twenty-four research institutes from different disciplines in science and engineering have joined forces to explore big data in the six domains of production, logistics, life sciences/healthcare, energy management, security, business and finance.

This presentation will illustrate this variety from the perspective of intelligent, automated workflow assistance in different big data settings. We start with an overview of attempts for automating the integration of heterogeneous structured and semi-structured data, e.g. in corporate as well as cross-organizational multi-database settings [2]. One set of application projects we are currently engaged in comprises different aspects of research data management, focusing on prevention of scientific fraud and traceability, while ensuring correct data ownership and shared understanding. Another important aspect in this context is the evolution analysis of contributions to scientific communities [3], be it open source communities or simply publication and citation networks. As another extreme, we look at highly scalable digital rights policies and management workflows within very large-scale video databases, contrasting automated techniques and "wisdom of the crowd" [4].

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