Preface

KSEM 2014 (the International Conference on Knowledge Science, Engineering and Management) followed an established tradition of long-standing conferences and was the seventh in the KSEM series, following the successful events in Guilin, China (KSEM 2006), Melbourne, Australia (KSEM 2007), Vienna, Austria (KSEM 2009), Belfast, UK (KSEM 2010), Irvine, USA (KSEM 2011), and Dalian, China (KSEM 2013).

KSEM 2014 was held in Sibiu, Romania, one of the most beautiful medieval towns in Transylvania. Due to its cultural richness along with its history, traditional values, architectural and geographical beauty, Sibiu was designated The European Capital of Culture for the year 2007 and, according to Forbes, it is one of Europe’s “most idyllic places to live.” The conference was hosted by Lucian Blaga University of Sibiu and was an opportunity to establish an international forum for aggregating and consolidating different technical viewpoints on the concept of “knowledge,” as they emerge from its various facets – engineering, management, and science. Epistemic aspects were discussed in relation to mathematical formalisms, business goals, or information system architectures, in order to highlight and stimulate refinements on the key enabling concept for a knowledge-driven society. Integration requirements emerged from a wide array of problems and research challenges, and the problem of bridging the gap between knowledge management and knowledge engineering was tackled from multiple perspectives.

Based on the reviews by members of the Program Committee, a selection of 30 full papers and four short papers were presented and included in this year’s proceedings. Additionally, three highly valued speakers provided keynote presentations, whose abstracts are also included here. We thank Acad. Prof. Ruqian Lu, Prof. Dr. Pericles Loucopoulos and Prof. Dr. Gheorghe Cosmin Silaghi for their inspiring keynote talks.

A large scientific community was involved in setting up KSEM 2014. We would like to extend our gratitude to everybody who contributed to the success of the event. First of all, we thank the authors who submitted their valuable work and the members of the Program Committee who provided their expertise for selecting and guiding the improvement of submissions. We greatly appreciate the support and advice of the conference chairs: Prof. Dr. Ioan Bondrea (Lucian Blaga University of Sibiu, Romania), Prof. Dr. Dimitris Karagiannis (University of Vienna, Austria), and Prof. Dr. Hui Xiong (Rutgers University, USA). We also thank the team at Springer led by Alfred Hofmann for the technical support in the publication of this volume.
The event would not have been possible without the extensive efforts of the Organizing Committee from Lucian Blaga University from Sibiu and of our host, Rector Prof. Dr. Ioan Bondrea.

October 2014

Robert Buchmann
Claudiu Vasile Kifor
Jian Yu
KSEM 2014 was hosted and organized by the Faculty of Engineering at Lucian Blaga University of Sibiu, Romania. The conference was held during October 16–18 2014 in Sibiu, Romania.

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Keynote Abstracts
Korchestration and the Korc Calculus

Ruqian Lu

Academy of Mathematics and Systems Science,
CAS Key Lab of Management, Decision and Information Systems,
Sino-Australian Joint Lab of Quantum Computing and Quantum Information Processing,
rqlu@math.ac.cn

Abstract. The orchestration technique has been popular in various fields of computing science and has got different names, such as computation orchestration, service orchestration, business orchestration, cloud orchestration, etc. Most of them have similar but slightly different meanings. In accordance with this, languages programming orchestration such as Orc, BPEL and Now have been developed. However, we have noticed there are two important aspects that are still less studied in orchestration research. They are orchestration for full cycle knowledge service and big data driven orchestration. We propose the concept of korchestration, which is short for knowledge orchestration, to fill this gap. At the same time we introduce the Korc calculus as a conservative extension of Orc calculus towards application of orchestration techniques in the above mentioned two areas. The various new features of Korc include weakly open world assumption, abstract knowledge source assumption, Boolean site calls, parallel logic programming, massive parallelism, fault tolerant computing etc.
Abstract. Turbulence is in the nature of business environments. Changes brought about because of different requirements such as social, political, technical and economic, exert pressures on organisations to respond in a timely and cost effective way to these challenges. In such an unstable environment information system developers are challenged to develop systems that can meet the requirements of dynamically changing organisations in a flexible manner. Against this dynamic business backdrop, emergent application software is regarded as a key component in the service industry of tomorrow. The effective and efficient development of such systems can have a major impact on the economic value of digital companies – that is companies for which enterprise software becomes the decisive driver behind product and service innovation. Rapid organisational change, knowledge-intensity of goods and services, the growth in organisational scope, and information technology, have all intensified organisational needs for a more formal approach to dealing with enterprise knowledge. In addition virtual organisations that are made up of complementary allied entities place greater demands on knowledge sharing. This talk advances a position, based on research work and the application of this work on many industrial and commercial applications, which states that, “central to successful business evolution through the use of information technology is Enterprise Knowledge Modelling”. Enterprise Knowledge Modelling involves many facets of the information systems domain including considerations such as technical (business processes, flow of information etc.), organisational and social (policies, structures and work roles etc.) and teleological (purposes and reasons). Conceptual modelling plays a central role in the way that one can capture, reason, represent, use for negotiation and agreement between many stakeholders and discover new knowledge from legacy systems.
Abstract. Assembling and jointly using different types of computing infrastructures like grids and clouds is an increasingly met phenomenon. To achieve this goal, research communities are building bridging technologies between the various sorts of infrastructures. These infrastructures are characterized by positive attributes like cost effectiveness, reliability, high performance and greenness. With this respect, joint commercial exploitation and increased user satisfaction represent contradicting challenges. To advance towards these goals, we will discuss two aspects of the interaction between resource providers and consumers: negotiation and scheduling in a multi-criteria setup. While both types of players possess limited knowledge about the opponents, we will design two interaction mechanisms allowing for service levels establishment and jobs placement, given the mitigation between providers and consumers.
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