

Knowledge management technologies for semantic multimedia services

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1 Summary

In ubiquitous or pervasive computing environment, end users want their services to be smart. Such smart services need to understand the semantics and context of the situation where the services are provided. In order to enable the understanding of the semantics and context, the knowledge of the service domain needs to be properly managed. On the other hand, the same knowledge may have different meanings in different domains depending on its size and the way of representing and using the knowledge. This indicates the importance of selecting the right knowledge in the right domain. This special issue features high quality contributions addressing for knowledge management technologies adopted by semantic multimedia services in ubiquitous and pervasive environments.

We have selected eight manuscripts for this special issue after the two rounds of reviews. Each selected manuscript was blindly reviewed by at least three reviewers consisting of guest editors and external reviewers.

The first paper entitled “A Framework of Spatial Co-location Pattern Mining for Ubiquitous GIS”, by Seung Kwan Kim et al. proposes a framework for co-location pattern mining using the transaction-based approach, which employs maximal cliques as a transaction-type dataset. The proposed framework is a theoretical methodology of co-

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location pattern mining, which supports geographic context awareness of ubiquitous general information services (GIS).

The second paper entitled “Digital Evidence Discovery of Networked Multimedia Smart Devices based on Social Networking Activities” by Hai-Cheng Chu et al. proposes a generic framework to be used by digital forensic specialists when networked smart devices are involved in criminal investigation cases, especially when omnipresent social networking platforms have become the new avenue for sophisticated cybercrimes.

Another paper in this special issue “Interactive Scheduling for Mobile Multimedia Service in M2M Environment” by Seungmin Rho et al. proposes a video processing algorithm which is mapped onto a learning method to improve machine to machine (M2M) architecture, namely, the parallel reconfigurable computing (PRC) architecture, which consists of multiple units.

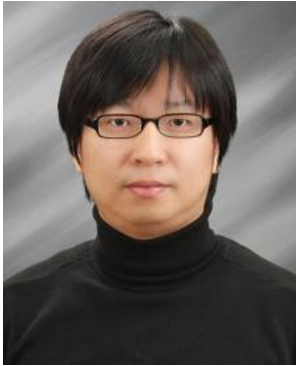
The fourth paper entitled “Optimizing Image Focus for 3D shape Recovery through Genetic Algorithm” by Ik-Hyun Lee et al. proposes a method to optimize focus measure for SFF (Shape Form Focus) based on genetic algorithms (GA). In the first step, a Wiener filter is used to remove the noise from the image sequence. In the second step, a segmentation algorithm is applied to separate the cell background. To optimize focus measure, a GA is applied on the variance components in a small window.

The fifth paper entitled “Converting Image to a Gateway to an Information Portal for Digital Signage” by Young-Hwan Choi et al. proposes a novel data fusion method for converting an advertisement image into a gateway to an information portal based on steganography technology for digital signage. The proposed system detects the product in advertisement images and embeds its quantized residual (QR) codes using the proposed image steganography.

The sixth paper entitled “Pointillist Video Stylization Based on Particle Tracing” by Sanghyun Seo et al. presents an algorithm that stylizes an input video into a painterly animation without user intervention. They particularly focus on pointillist animation with stable temporal coherence, which is an important problem in non-photorealistic rendering for videos. The proposed algorithm is a new approach for long-range motion estimation in video, which can control the density of particles by considering the features of frames and importance maps.

The seventh paper entitled “Real-Time Cooling Load Forecasting Using a Hierarchical Multi-class SVDD” by Daeheon Park et al. presents a real-time cooling load forecasting system that overcomes the problems associated with conventional methods. The proposed system is a new load forecasting model that hierarchically combines Support Vector Data Descriptions (SVDDs). The system selects an optimal attribute subset using the proposed cooling load forecasting system that enables real-time load data generation and collection.

The last paper entitled “Evidence-driven Decision Support in Critical Infrastructure Management through Enhanced Domain Knowledge Modeling”, by Seok-Won Lee presents an integrated framework to support effective critical infrastructure management and its proto-type system called extend this term (IRSV) system. The proposed framework is flexible (supporting the user-centered language in various formats), scalable (covering much larger and complex search space) and adaptable (being able to combine various services using pieces of available knowledge).



Dr. Changhoon Lee received his Ph.D. degree in Graduate School of Information Management and Security (GSIMS) from Korea University, Korea. He is now an assistant professor in Department of Computer Science and Engineering, Seoul National University of Science & Technology, Korea. Prior to this, he was a research professor in Center for information Security and Technology, Korea University, Korea in 2008. From 2009 till 2010, He was a full-time lecturer in the School of Computer Engineering of Hanshin University, Korea and was an assistant professor in the School of Computer Engineering of Hanshin University, Korea in 2011. He has also served as chairs and program committees for many international conferences and workshops. He has been serving as a guest editor for international journals by some publishers. His research interests include information security, cryptography, digital forensics, convergence security etc.



Dr. Wenny Rahayu is currently the Head of the Department of Computer Science and Computer Engineering La Trobe University. Prior to this appointment, she taught computing at Swinburne University, and held an industry position. She received a PhD in Computer Science from La Trobe university in 2000. Her PhD thesis in the area of Object-Relational Databases has been awarded the Best PhD Thesis 2001 by the Computer Science Association Australia (CORE). In 2003, she has been awarded the Dean's Award for excellence in teaching. She has been involved in the curriculum development process of the Postgraduate by coursework degrees (2004–2005), undergraduate degree restructuring in the department especially in relation to Database and Information System stream (2006–2007), and the development of double-degree programs in Business, and Health Information Management. She is currently the Director of Academic Studies in the department. The main focus of her research is the integration and consolidation of heterogeneous data and systems to support a collaborative environment within a highly data-rich environment. To date, she has been the principle investigator or one of the chief investigators of 2 ARC Linkages, large industry collaboration grants,

international grants (Japan JSPS and Australia Indonesia AIGRP), International standard bodies such as Open Geospatial Consortium (OGC), VPAC (Victoria Partnership for Advanced Computing), and the AAS (Australia Academy of Science). In the last 10 years, she has published two authored books, three edited books and more than 100 research papers in international journals and proceedings. She has supervised to completion 10 PhDs, around 30 Honours, and 10 masters students.



Dr. Uyen Trang Nguyen received her Bachelor of Computer Science and Master of Computer Science degrees in 1993 and 1997, respectively, from Concordia University, Montreal, Canada. She completed her Ph.D. degree at the University of Toronto, Canada, in 2003. From 1995 to 1997 she was a software engineer at Nortel Networks, Montreal, Canada. She joined the Department of Computer Science and Engineering at York University, Toronto, Canada, in 2002 and is currently an Associate Professor. Her research interests are in the areas of mobile computing, wireless networking, multimedia applications and information security. She is currently the Director of the Graduate Program in Computer Science and Engineering of York University. She was a program co-chair of the 3rd International Conference on Mobile, Ubiquitous, and Intelligent Computing (MUSIC 2012). She was also a program vice-chair of the 13th IEEE International Conference on High Performance Computing and Communications (HPCC 2011) and the 7th International Conference on Future Information Technology (FutureTech 2012).