GUEST EDITORIAL PREFACE

Special Section from the IEEE International Symposium on Multimedia (ISM) 2012

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For more than a decade of conferences, the *IEEE International Symposium on Multimedia* (ISM) has established itself as an international renowned forum for researchers and practitioners to exchange ideas, connect with colleagues, and advance the state-of-the-art and practice of multimedia computing, as well as to identify emerging research topics and to define the future of this cross-disciplinary field.

In 2012 the conference was held in Irvine, California and counted 105 full paper submissions to the main conference. Every submission was reviewed thoroughly by several experts from the technical program committee and then selected for either acceptance or rejection. Only 26 papers were accepted as full length regular papers.

This represents the top 24.8% papers. Out of these papers, again six papers were selected for publication in the *International Journal of Multimedia Data Engineering and Management* (IJMDEM) and the *International Journal of Semantic Computing* (IJSC). The selection was based on the papers' reviews and fit to the respective areas of the journals. The authors extended and enriched their workwith novel research results, broader discussions of related work and information that could not be included in the conference papers to make the papers more informative for the reader. The papers included in this special section are *An Innovative Multiple-Object Image Retrieval Framework Using Hierarchical Region Tree* by Wei-Bang Chen and Chengcui Zhang as well

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as *High Performance Online Image Search with GPUs on Large Image Databases* by Ali Cevahir and Junji Torii.

Chen and Zhang present a framework for multiple object image retrieval that is based on hierarchical image representation. The framework is designed for content based image retrieval and works with hierarchical representations for both query and target images. The authors introduce a novel concurrent segmentation algorithm that preserves spatial relationships, and is optimized for efficiency in multi-level analysis. As query images may contain irrelevant objects, the overall system described by the authors learns which object the user is searching using a support vector machine. This approach allows for improving search results based on scarce relevance feedback. The authors have conducted an evaluation that compares their approach to a number of state-of-the-art competing systems using a data set of 10,000 nature scene images. In the evaluation the approach outperforms all other approaches.

Cevahir and Torii describe an online image search system for large databases by benefiting from GPUs. Their proposed system has offline and online stages. In the offline phase, keypoints (128-element SIFT features) from images in the database are extracted first and then these keypoints are organized into clusters using hierarchical k-means clustering. The online querying part includes finding the closest cluster for the keypoints of a query image; applying kNN to find k-closest nearest neighbors with one-to-one matching (i.e., a query keypoint can be matched to at most one keypoint of an image); and scoring & ranking of the results. All these components can be managed with GPU support. If GPU is used, the authors claim up to 104 times speedup for finding the closest cluster; 20.5 times speedup for matching keypoints (kNN); 265 times speedup for clustering with respect to the CPU-only version of the system. They compare their results with GPU-powered Bag-of-visual-words (BoV) using textual search engines and they show that their system has 9.5% improvement on the precision.

We would like to thank the authors for their effort in extending their top-quality papers for this special issue. We would also like to thank all those who made ISM 2012 a success, especially the program committee members who also helped prepare the selection process for this special section and the General Chairs Phillip C.Y. Sheu, and Mihaela van der Schaar who made both this special issue and the conference happen.

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IJMDEM

Ramazan S. Aygün received the B.S. degree in computer engineering from Bilkent University, Ankara, Turkey in 1996, the M.S. degree from Middle East Technical University, Ankara in 1998, and the Ph.D. degree in computer science and engineering from State University of New York at Buffalo in 2003. He is currently an Associate Professor in Computer Science Department, University of Alabama in Huntsville. Dr. Aygun has served on organizing committees of conferences as a co-chair of sessions including IEEE International Conference on Semantic Computing (2007-2009), IEEE International Symposium on Multimedia (2006, 2008). He was the program co-chair of IEEE International Symposium on Multimedia in 2012. Dr. Aygun has also served on the program committees of around 30 conferences and workshops including ACM Multimedia, MIR Workshop, DEXA, IEEE Int. symposium on Multimedia, and AxMedis. His research interests include multimedia databases, P2P systems, semantic computing, multimedia networking, multimedia synchronization, and video processing.

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Robert Mertens received his B. Sc in cognitive science and his Ph.D. in computer science from the University in Osnabrück, Germany in 2002 and 2007 respectively. During all stages of his academic career, he has spent time on international research stays: In 2000/2001 as an intern at DaimlerChrysler RTC in Palo Alto, CA, in 2006 as a visiting research scholar at the University of Pittsburgh in Pittsburgh, PA, and in 2011 as a postdoctoral research fellow at the International Computer Science Institute (ICSI) in Berkeley, CA. In 2002 he started working on multimedia interfaces at the University of Osnabrück's virtUOS center. In 2007 he started working at Fraunhofer IAIS in Sankt Augustin as project manager and consultant. At ICSI he worked on audio processing and machine learning for multimedia event detection. Since 2012 he is a professor for Application Development and Media Informatics at the HSW University of Applied Sciences in Hamelin, Germany.

Atsuo Yoshitaka graduated from Hiroshima University in 1989, and received his master and doctor of engineering degrees from Hiroshima University in 1991 and 1997, respectively. He is currently an associate professor at Japan Advanced Institute of Science and Technology. His research interest includes content-based retrieval for multimedia databases, image/video indexing, affective information processing, and visual user interfaces. He is a member of IEEE Computer Society, the Institute of Image Information and Television Engineers, and the Information Processing Society of Japan.

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