Special Issue Editorial

Information Hiding and Multimedia Signal Processing

Accessing various multimedia contents is something very essential in our daily life. However, delivery of multimedia contents consumes lots of network bandwidths. Therefore, compression of multimedia is very essential, and also an inevitable task for real applications. Moreover, due to the noise induced during the transmission of data, reliable transmission of compressed multimedia is also an important issue in both academic research and real applications.

In addition, with the vast amount of multimedia data, how to efficiently and effectively retrieve the necessary data is a challenging task. Also, due to the ease of delivering files over the Internet, copyright protection of the above-mentioned multimedia data seems indispensable. Briefly speaking, topics in information hiding and multimedia signal processing are popular among academia, which is also much required for industrial applications.

Despite the advances made, progress across the board has been moderate. The Second IEEE International Conference on Intelligent Information Hiding and Multimedia Signal Processing (IIH-MSP'06) held in Pasadena, California during December 18-20, 2006; gathered individual researchers who are also the world's most respected authorities on both the fields of *information hiding* and *multimedia signal processing*. This special issue comprising of fourteen papers is focused on the various aspects in both multimedia signal processing and information hiding research domains. Papers were carefully selected to meet the state-of-the-art trends. The papers are organized as follows.

First category comprises of 5 papers with topics related to information hiding and digital watermarking. In the first paper, *Chang et al. [1]* present the reversible data embedding scheme suitable for color images. The purpose of reversible data hiding is to perfectly recover both the original and the embedded data. The authors broaden the use of reversible data embedding from grey-level images to color images.

Next, *Yoshioka et al. [2]* demonstrate the information hiding scheme on lossless data compression. They make use of the properties of lossless data hiding techniques, such as ZIP, to incorporate with the data embedding algorithm proposed.

In the third paper, *Tsai et al. [3]* propose a strategy for opposing DC components watermarking. The authors in this paper show some effective schemes to counteract the watermarking attacks.

In the fourth paper, *Atomori et al. [4]* introduce the robust video watermarking algorithm based on dual-plane correlation for immunity to rotation, scale, translation (RST), and random distortion. RST attacks are commonly encountered in real applications. The authors depict the fundamental concepts, and propose their algorithm with promising results.

In the fifth paper, *Han et al. [5]* focus on an adaptive non-uniform quantization (ANUQ) algorithm that is suitable for the applications in biometric systems. Beginning from the derivations with fundamental concepts, simulation results demonstrate its usefulness.

Second category comprises of seven papers discus various techniques in multimedia signal processing, including video compression, multimedia transmission, pattern classification and multimedia retrieval. In the sixth paper, *Kwon et al. [6]* consider an optimal two-pass frame-layer bit allocation scheme for H.264 video. The proposed algorithm is useful for video streaming applications, where video sources can be encoded off-line.

In the seventh paper, *Eiamjumrus and Aramvith [7]* introduce the rate control scheme based on Cauchy rate-distortion optimization model for h.264/AVC under low delay constraint. The Lagrange multiplier technique is used to optimize the cost function composed of the target bit rate constraint and the resulting quantization step size.

In the next paper, *Ito and Makino [8]* employ the error resilient coding scheme called multiple descriptions coding for transmitting the audio streams. The authors discuss a method of splitting one audio stream into two equal-quality streams based on theoretical derivations, and describe the optimum recovery transform to recover a signal from one of the split signals.

Wang et al. [9] in the ninth paper investigate the fire-alarm system based on video processing. With a chromaticity-based decision function in static characteristic and a diffusion-based decision function in dynamic characteristic, smoke detection can be performed, providing an early alarm at a lower false alarm rate before the fire burns up.

In the tenth paper, *Li et al. [10]* utilize the pattern classification scheme based on maximum margin criteria. Authors create a constrained optimization problem based on maximum margin criterion, and transform the optimization problem into an eigenvalue problem for obtaining the unique solution.

In the eleventh paper, *Lin and Jiang [11]* depict an adaptive online recursive learning algorithm for least squares SVM classifiers. With this algorithm, less computational cost and high predicting accuracy can be obtained.

Next, *Zhao et al. [12]* make use of the co-training for search-based automatic image annotation. Based on co-training and classification techniques, the authors address a novel scheme for search-based image annotation.

Finally, the third category comprises of two papers addressing various issues related to data transmission over computer and wireless networks. In the thirteenth paper, *Horng et al. [13]* propose a fast-startup TCP mechanism for VoIP services in long-distance networks. Algorithms therein are beneficial to offer a loss-free and rate-adaptive transport service for VoIP connections.

Moreover, in the last paper, *Lai et al. [14]* present a power control MAC protocol for wireless ad hoc networks. Results with improved energy efficiency and channel utilization can be found.

The editors wish to thank the referees who have critically evaluated the papers within the short stipulated time. Finally we hope the reader will share our joy and find this special issue very useful. Editors are grateful to Dr. Hsiang-

Jeng-Shyang Pan[1] and Ajith Abraham[2]

[1] Department of Electronic Engineering
National Kaohsiung University of Applied Sciences
415 Chien-Kung Road,
Kaohsiung 811, Taiwan
jspan@cc.kuas.edu.tw

[2] Norwegian Center of Excellence
Center of Excellence for Quantifiable Quality of Service
Norwegian University of Science and Technology,
O.S. Bragstads plass 2E,
N-7491 Trondheim, Norway
ajith.abraham@ieee.org

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Editor Biographies

Jeng-Shyang Pan received the B. S. degree in Electronic Engineering from the National Taiwan University of Science and Technology in 1986, the M. S. degree in Communication Engineering from the National Chiao Tung University, Taiwan in 1988, and the Ph.D. degree in Electrical Engineering from the University of Edinburgh, U.K. in 1996. Currently, he is a Professor and Chairman in the Department of Electronic Engineering, National Kaohsiung University of Applied Sciences, Taiwan. He was the Visiting Professor in both University of Adelaide and University of South Australia in 2001 and 2002. He joined the editorial board of *LNCS Transactions on Data Hiding and Multimedia Security, Journal of Information Assurance and Security,* and *International Journal of Hybrid Intelligent System.* He also serves as the Co-Editor-in-Chief of *International Journal of Innovative Computing, Information and Control,* and the Editor-in-Chief of *International Journal of Computer Sciences and Engineering Systems.*

Professor Pan has published more than 250 papers and book chapters. He is the founder for both the *International Conference on Intelligent Information Hiding and Multimedia Signal Processing* (IIHMSP) and *International Conference of Innovative Computing, Information and Control* (ICICIC). His current research interests include soft computing, information security, circuit and system design, and signal processing.

Ajith Abraham currently works as a Visiting Professor in the Center of Excellence for Quantifiable Quality of Service, Norwegian University of Science and Technology, Trondheim, Norway. Dr. Abraham received Ph.D. degree from Monash University, Melbourne, Australia and a Master of Science Degree from Nanyang technological University, Singapore. His research and development experience includes over 16 years in the Industry and Academia spanning different continents in Australia, America, Asia and Europe. He works in a multi-disciplinary environment involving computational intelligence, network security, sensor networks, e-commerce, Web intelligence, Web services, computational grids, data mining and applied to various real world problems. He has given more than 20 plenary lectures and conference tutorials in these areas. He has authored/co-authored over 350 refereed journal/conference papers and book chapters and some of the works have also won best paper awards at international conferences and also received several citations. He is an Associate Editor of the Journal of Digital information Management (JDIM) and is also serving the editorial board of over two dozen International Journals and has also guest edited 25 special issues for reputed International Journals. Since 2001, he is actively involved in the Hybrid Intelligent Systems (HIS); Intelligent Systems Design and Applications (ISDA) and Information Assurance and Security (IAS) series of International conferences. He is the General Co-chair of the Tenth International Conference on Computer Modeling and Simulation, (UKSIM'08), Cambridge, UK; Second Asia; International Conference on Modeling & Simulation (AMS 2008), Malaysia; Eight International Conference on Intelligent Systems Design and Applications (ISDA'08), Taiwan, Fourth International Symposium on Information Assurance and Security (IAS'08), Italy; Eighth International Conference on Hybrid Intelligent Systems (HIS'08), Spain; and the Program Chair/Co-chair of Third International Conference on Digital Information Management (ICDIM'08), UK; Second European Conference on Data Mining (ECDM 2008), Netherlands and The 16th International Conference on Neural Information Processing (ICONIP'08), New Zealand. He is a senior member of IEEE, IEEE Computer Society, IEE (UK), ACM etc. More information at: http://www.softcomputing.net