Guest Editorial

The area of Multimedia Signal Processing is now playing an important role in the continuing development of still more integrated information systems. Contributions from different technical disciplines are now merging into solutions for Human-Machine Interfaces, and for Integration of Media and Networks. The presentations in this Special Issue originate in papers selected from the 1999 IEEE Third Workshop on Multimedia Signal Processing, held in Copenhagen, Denmark, September 13–15. The workshop was organized by the IEEE Multimedia Signal Processing Technical Committee of Signal Processing Society.

The subjects of the papers in this issue are within the two areas: Scene Analysis and Object Based Modeling; and Design and Analysis of Multimedia Systems.

The first paper on Scene Analysis and Object Based Modelling is Changick Kim, Jenq-Neng Hwang, University of Washington, “Video Object Extraction for Object-Oriented Applications”, which describes an automatic detection-based VO extraction algorithm for surveillance type applications and MPEG-4 object based coding. The semantically meaningful video objects are here obtained by a regularization stage realized by means of a cascade of morphological filters. The paper by I-Jong Lin, Hewlett-Packard Laboratories, S. Y. Kung, Princeton University, “Extraction of Video Objects via Surface Optimization and Voronoi Order”, integrates the concept of Voronoi order with existing surface optimization techniques to form an object segmentation for MPEG-4 and MPEG-7 applications. The optimization is carried out through dynamic programming within an iterative framework. The paper by Stéphane Valente, Ecole Nationale Supérieure des Mines de Paris, Ana C. Andrés del Valle, Jean-Luc Dugelay, Institut Eurécom, “Analysis and Reproduction of Facial Expressions for Realistic Communicating Clones”, presents a view-based approach to quantify and reproduce facial expressions in animations targeted for MPEG-4 applications. The approach embeds efficient mesh morphing and texture animations to synthesize facial expressions. The paper by KyoungHo Choi, Ying Luo, Jenq-Neng Hwang, University of Washington, “Hidden Markov Model Model Inversion for Audio-to-Visual Conversion in an MPEG-4 Facial Animation System”, describes a model inversion method for the insertion of an animated face into a natural or synthetic video stream targeted for virtual working environments and video conferencing.

The first paper on Design and Modelling of Multimedia Systems is Monson H. Hayes, Michele L. Jamrozik, Georgia Institute of Technology, “Internet Distance Learning: The Problems, The Pitfalls, and the future”, which describes experiences with tools developed for Internet course delivery between Georgia Institute of Technology in Atlanta and a campus in the Lorraine region of France. Furthermore the paper discusses problems and limitations with on-line course production and delivery. The paper by Benoît Maisson, Chalapathy Neti, Andrew Senior, IBM Thomas J. Watson Research Center, “Audio-visual Speaker Recognition for Video Broadcast News”, describes a fusion of video and audio based speaker identification for recognition improvement in acoustically degraded environments. Specifically, techniques to optimally determine the relative weights of independent decisions based on audio and video are explored. The paper by Ce Wang, Scott Griebel, Bo-June (Paul) Hsu, Michael Brandstein, Harvard University, “A Framework for Acoustic and Visual-Based Talker Tracking and Audio Enhancement in a Practical Environment”, presents a real-time system for face tracking of a talker. The system is robust to visual clutter and acoustical noise and is targeted for video conferencing or surveillance applications. The paper by Hai Liu, Nirwan Ansari, Yun Q. Shi, New Jersey Institute of Technology, “Modeling MPEG Coded Video Traffic by Markov-Modulated Self-Similar Processes”, presents modelling of the long range autocorrelation dependencies of an MPEG video sequence by a Markov model control of self similar processes. Empirical studies show that this models the dependencies very well. The paper by Maija Metso, Antti Koivisto, Jaakko Sauvola, University of Oulu, “Content Model for Mobile Adaptation of Multimedia Information”, proposes a model for the representation and

adaptation of multimedia contents in bandwidth limited mobile hybrid systems, which use Internet services. The model proposed is media and presentation format independent, and includes a layered mapping of semantic and physical entities. The next paper by Saturnino Luz, Niels Ole Bernsen, University of Southern Denmark, “Interactive Advice on the use of Speech in Multimodal System Design with SMALTO” presents a decision tool for the generation of advices on the use of speech input and/or output in multimodality systems. The system aims mainly at supporting decisions at early design stages, however further use of the system as a part of a complete domain-oriented design environment is also envisaged. In the paper “Crossing The Man-Machine Divide: A Mapping Based On Empirical Results” by G. Ghinea, Brunel University, J.P. Thomas, Pace University, an approach to the design of user-centered communications protocols is presented, which could provide the basis for a user-oriented Quality of Service parameter management system. It is shown that a relation of proportionality between Quality of Perception and low-level Quality of Service parameters can be obtained, if the multimedia presentation content is taken into account.

I would like to take this opportunity to thank all the authors for cooperating on the accomplishment of this special issue and also thank the editor-in-chief Prof. S.Y. Kung for inviting me to organize this special issue and for his guidance during the process and also thanks to the Academic Publishers’ staff for support during the work.

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