
Editorial

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Biographical notes: Dimitrios A. Karras received his Diploma and MSc Degree in Electrical Engineering from the National Technical University of Athens (NTUA), Greece in 1985 and a PhD Degree in Electrical and Computer Engineering, from the NTUA in 1995, with honours. Since 2004 he has been with the Chalkis Institute of Technology, Automation Department, Greece as Professor in Digital Systems and Signal Processing as well as with the Hellenic Open University as Visiting Professor in Communication Systems. He has published more than 50 journal papers in pattern recognition, image/signal processing, neural networks and bioinformatics and more than 140 research papers in international conferences. His research interests span pattern recognition and neural networks, image and signal processing and systems, biomedical systems, communications, networking and security. He has served as program committee member, program and general chair in many international workshops and conferences in signal, image and automation systems. He is Editor-in-Chief of the *International Journal of SISE*.

George C. Giakos is a Faculty in the Department of Electrical and Computer Engineering, and Biomedical Engineering, at the University of Akron, OH, USA. In addition, he is the Director of Imaging Technologies and Surveillance Technologies, Molecular Nanophotonics, and Applied Nanosciences Laboratories. His research is articulated in the design of imaging systems, ladars and surveillance sensor platforms for the Department of Defense and Homeland Security, multispectral polarimetry, exploration of molecular pathways and signatures for early detection of disease. His research group was the first in the USA to pioneer the characterisation of the detection and imaging characteristics of Cadmium Zinc Telluride for flat-panel radiography applications. His research has been rewarded with fifteen (15) US Patents and more than 150 peer-review articles. He is the recipient of a Distinguished Faculty Fellow Award, from the Office of Naval Research. He received numerous prestigious research awards from AFRL, NRL, and NASA.

The issue 3, V2, 2009 of the *International Journal of Signal and Imaging Systems Engineering* (IJSISE) covers a lot of topics in the design of signal and image processing systems as well as in the design and evaluation of the associated algorithms. It contains seven regular papers.

The first paper by Yazdi et al. investigates an interesting novel methodology and designs the corresponding system for efficient key frame extraction video shot representation (summarisation), which employs a Support Vector Machine-based relevance feedback (SVM-RF) to bridging semantic gap between low-level feature and high-level concepts of shots.

The second paper by Sureshkumar et al. studies a novel system called "Semantic Image Annotation System

for building Relationship among Objects (SIASRO)", which is capable to annotate multi-object images and to identify the natural semantic relation based on the position and arrangements of the objects. An interesting image segmentation technique, the "Enhanced Region Growing and Labelling" algorithm, is integral in the authors proposal for extracting the individual objects present in the image and its colour.

In the sequel the paper by Pande et al. presents a new method for intelligent transmission of important segments of video sequences over a network. It incorporates the knowledge of the network conditions to determine how various parts of the video frames are encoded. An estimate of the available network bandwidth is obtained which is

then distributed optimally between the different frame constituents based on their relative importance and motion by the bandwidth allocation module. The proposed methodology integrates a simple approach to classify the videos into visual objects followed by use of Discrete Wavelet Transform based Colour Embedded Zerotree Wavelet (CEZW) coding to obtain a scalable bitstream that provides dynamic response to changing network conditions. It is shown that this methodology might result in an optimal trade off between perceptual quality of the video and the available network bandwidth.

The fourth paper by Kumar et al. involves a constrained optimisation technique for the design of a two channel Quadrature Mirror Filter (QMF) bank. A new method is developed based on ideal characteristics of a prototype filter and overall response of the filter bank in transition band. The design problem is formulated as nonlinear constrained optimisation of an objective function and Sequential Quadratic Programming (SQP) is involved in order to solve it. Performances of this method are evaluated in terms of reconstruction error, mean square error in passband, stopband and transition band.

Next, the paper by Yamuna and Sivakumar suggests a novel reversible watermarking scheme based on histogram modification for the authentication of military images. The original image can be recovered in the proposed scheme without any distortion from the watermarked image after the hidden data have been extracted. In this process, The Hash Message Authentication Code (HMAC) of the image is calculated and embedded into the image for future authentication. Based on a new criterion, the distinct pixel values with Non-Zero Frequencies (NZF) of the histogram are selected in an order to embed the watermark bits and the preferred pixel values are stored as a key. This key is used for both the extraction of the watermark data and the restoration of the original image. The bits of extracted

HMAC from the marked image and HMAC of the restored image are compared for the authentication purpose. It is found that the probability to produce similar such HMAC is very small.

The paper by Parimala Geetha investigates an optical neural network methodology for the detection of facial expressions in images by extracting the associated gabor texture features. The Karhunen–Loeve Transform is involved to identify the facial expression of the detected face. Results are analysed using the Cohn-Kanade facial expression database and the classification rate is found to be higher compared to the approaches met in the literature.

Finally, the paper by Shaaban investigates systematically a Genetic algorithm adopted in order to extract realistic values of the transport properties of both electrons and holes in semiconductor materials. A theoretical waveform model has been fitted to the real digitised signal waveform taking into account the realistic transport parameters. This method is found to be simple and useful for pulse shape analysis as well as promising for the estimation of detector parameters in semiconductor detectors.

We hope that this issue, covering so many different aspects, will be of value for all readers. We would like to thank all authors and reviewers for their invaluable work and we are sure that the increasing interest for this journal will attract many more important research papers. We think that the quality has reached a certain level but we should not be satisfied with only this fact. Our efforts will focus on improving quality and especially indexing of this journal in the near future. To this end, we emphasise again that we need your help by submitting high quality research papers citing works already published in this journal. Your high quality comments and research reports are always more than welcome and very helpful to meet out targets.