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 Dept., 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 IJSISE.

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 US 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 present issue of the *International Journal of Signal and Imaging Systems Engineering* (IJSISE) is again a very interesting double issue 1&2, V2, 2009 covering many aspects in the field of signal/image processing and systems engineering. It contains 12 regular papers.

The first paper by H.J. Pandya investigates thin film tin oxide ethanol sensors in terms of sensitivity variation of films having different thickness. A new method is proposed to improve sensitivity and selectivity further through depositing a thin layer of metal oxide on the sensor surface. The response and recovery times of sensor were determined.

The second paper by Azza Ouled Zaid, Ammar Bouallègue, Christian Olivier and Amine Nait-Ali studies compression and denoising of coronary angiographic images proposing a Comp-Denoiser system adapted to coronary X-ray images. To this end, the Wavelet-based Trellis Coded Quantisation (WTCQ) algorithm is extended to incorporate a bivariate thresholding process that considers the dependencies between the coefficients and their parents in detail wavelet sub-bands. Experimental results show that despite its simplicity and computational efficiency, authors' method yields a higher compression performance with a superior image quality.

In the sequel the paper by Ruzairi Abdul Rahim et al. develops an Optical Tomography System using Digital Signal Processor emphasising Velocity Profile Measurement for reconstructed optical tomography images. The authors used a new method to measure the flow velocity at each pixel by cross correlating the upstream pixel values with respective downstream pixel values or upstream sensor values with respective downstream

sensor values. The algorithm to perform cross correlation is discussed.

The next paper by Noha Shaaban presents a theoretical analysis of B-spline signal representation from a signal processing point of view. The noise component included in the measured signal waveform affects the result of numerical signal waveform processing. In order to suppress this influence, the author investigated the smooth waveform data prior to the numerical analysis. The smoothed signal rise time and the improved energy spectrum of a planar Cd-Zn-Te semiconductor detector have been introduced in order to show the effectiveness of the method.

The fifth paper by K. Santle Camilus et al. investigates a promising new mean based graph theoretic approach for image segmentation, capable of accurately locating region boundaries. The proposed method is non-supervised and leads to robust results unaffected by outliers.

Next, the paper by T.N. Nagabhushan, S.K. Padma and Bhanu Prasad studies performance of auto-configuring RBF Networks trained with significant patterns. Actually, it presents two new interesting ideas to improve the performance of Radial Basis Function (RBF) networks. In the first instance, the authors choose a set of patterns for training, which are closer to decision boundaries, from amongst the different classes of training samples that constitute the input space. Secondly the authors use these significant patterns to train an Adaptive incremental learning RBF network and a Resource Allocating Network. The improved learning curves and generalisation characteristics of the generated RBF networks are presented.

Restoration of Motion Blurred Images is, next, studied by Pankaj Kumar Sa et al. In most of the real life applications of imaging, the point spread function responsible for degrading the observed images is not known. Hence, both blur (point spread function) and image must be identified from the observed noisy blurred image. The authors present a computationally simple iterative blind deconvolution algorithm that alternates between Fourier and spatial domain. The observed noisy blurred image is assumed to be the output of a two dimensional FIR system, which can be termed as a linear shift-invariant process. This method delivers good results for images having uniform background intensity.

The paper by Hadi Sadoghi Yazdi, Sohrab Effati and Zahra Saberi presents an important reformulation of SVM to a recurrent neural network model which can be described by the nonlinear dynamic system. In the proposed very interesting iterative algorithm for SVM, training is independent from selected initial point. Each training sample is converted to one constraint. Probabilistic constraints are recommended for reducing effect of noisy samples in training procedure and appearance of incorrect support vectors. Probabilistic constraints admit using knowledge about distribution function of samples. This idea gives ability into reduction of noisy samples effect for finding support vectors. A set of differential equations is used to modelling of the proposed probabilistic SVM. These equations are converged to optimal solution for SVM. Capability of the proposed method is shown by experimental results in the optical character recognition and synthetic data.

The ninth paper by H.J. Pandya again, studies Thin Film Indium Tin Oxide acetone sensors in terms of operating temperature, response of the film as well as sensitivity and selectivity of thin film sensors.

Robust Object Segmentation using Split and Merge (SM) is successfully investigated by A.B.M. Faruquzzaman et al. More specifically, the authors attempt to address major problems of split and merge segmentation by proposing their novel robust object segmentation using split and merge (ROSSM) considering image feature stability, inter- and intra-object variability, and human visual perception. The qualitative analysis has been conducted and the segmentation results are compared with the basic SM algorithm and a recently developed shape-based fuzzy clustering algorithm namely object based image segmentation using fuzzy clustering (OSF). The ROSSM algorithm outperforms both the SM and the OSF algorithms and hence increases its application area.

The next paper by V.S. Sheeba and Elizabeth Elias discusses an adaptive loading scheme in wireless multicarrier modulation systems, using variable-rate variable-power, coded, M-ary quadrature amplitude modulation. The principal component filter bank (PCFB) which is adapted to the channel characteristics, is used for converting the wideband channel into narrow band sub-channels so that the filter responses depend on the channel frequency response and noise spectrum. The authors make use of optimal power allocation strategy to maximise the capacity of the system. PCFB based adaptive loading scheme gives better performance in terms of spectral efficiency and bit error rate, compared to the conventional adaptive loading scheme in multicarrier system.

Finally, the paper by Ashfaqur Rahman and Manzur Murshed investigates a motion based approach for segmenting dynamic textures aiming at addressing the problem of segmenting image sequences consisting of multiple dynamic textures. More precisely the authors separate image segments having different characteristic motion patterns – a key attribute of individual dynamic textures. Experimental results demonstrate the ability of the proposed technique by segmenting a wide variety of multiple dynamic texture image sequences.

We hope that this double issue, covering so many aspects, will be interesting again. 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 important research papers. Our efforts will focus, therefore, on improving indexing of this journal in the years to come. To this end, we need your help by submitting high quality research papers citing works already published in this journal. Let us work together to improve quality of this journal. Your comments and research reports are always more than welcome.