
Editorial

D.A. Karras

Department of Automation,
Chalkis Institute of Technology,
Chalkis, Greece
E-mail: dakarras@teihal.gr
E-mail: dakarras@ieee.org

G.C. Giakos

Department of Electrical and Computer Engineering,
The University of Akron,
Akron, OH 44333, USA
E-mail: giakos@msn.com
E-mail: giakos@uakron.edu

Biographical notes: Dimitrios A. Karras received his Diploma and MSc in Electrical Engineering from the National Technical University of Athens (NTUA), Greece, in 1985 and a PhD in Electrical and Computer Engineering with honours from the NTUA in 1995. Since 2004, he has been with the Chalkis Institute of Technology, Automation Department, Greece, as a Professor in Digital Systems and Signal Processing as well as with the Hellenic Open University as a 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 a programme committee member, programme and general chair in many international workshops and conferences in signal, image and automation systems. He is Editor-in-Chief of *International Journal of SISE*.

George C. Giakos is a Professor 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 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. He is an IEEE Fellow.

The first issue for 2011 of the *International Journal of Signal and Imaging Systems Engineering* (IJSISE) contains seven interesting regular papers, the majority of them covering different aspects of imaging systems. More specifically, important aspects of imaging systems research as face detection, image indexing and retrieval, image compression and image representation are herein proposed. In addition, two papers covering signal systems research, namely blind estimation in multipath acoustic channels and noise subspace high resolution for spectral estimation, are presented in this issue.

The first regular paper by M. Beniak, J. Pavlovičová and M. Oravec from Slovak Republic describes a new face detection and face features localisation algorithm. The authors use YCbCr colour model to achieve luminance and

chrominance components separation leading to statistically relatively independent representation of skin colour components. Their model is simple and technically compatible with the video broadcasting applications and videophone technology, involving pixel classification based on 3D histogram chrominance components and mathematical morphology.

In the sequel, the paper by R. Nath, A.K. Chaturvedi and G. Sharma from India presents a Modified Blind Estimator (Modified Autocorrelation based Estimator – MAE) algorithm for estimation of time delays in multipath acoustic channel in the presence of uncorrelated noise. The multipath acoustic channel output signal is modelled as a superposition of the delayed, attenuated and filtered versions of the stationary Gaussian stochastic input signal.

The simulation results show that MAE performance approaches the equivalent CRLB in terms of accuracy percentage measures in the high SNR ranges, while at increased SNR levels or at decreased path numbers MAE performance is improved.

The third paper by Mujahid Al-Azzo from Jordan deals with a new high-resolution method for estimating discrete spectra. It is suggested that such methods overcome the resolution limit of the Fourier transform and could provide accurate estimates of the signal parameters. The problem of spatial detection and imaging of closely separated objects is investigated and a method based on noise subspace of the correlation matrix of the noise-corrupted signal for ultrasonic holographic imaging is described. The in-line holography is employed, where the amplitude and phase of a coherent wave are recorded. The performance of the method is favourably compared with the traditional Fourier transform method for different values of signal to noise ratio (SNR) and synthetic aperture length.

The next paper by M. Subrahmanyam, R.P. Maheshwari and R. Balasubramanian from India investigates a new image-indexing algorithm based on the combination of wavelet and Rotated Wavelet Correlogram (RWC) in contrast to the Gabor Wavelet Correlogram (GWC). It is claimed and shown that this method is six times faster than the Gabor wavelet correlogram making it suitable for online applications. The retrieval results of the proposed method are very favourably compared with state-of-the-art techniques on three different benchmark databases.

The fifth paper by P. Arockia Jansi Rani and V. Sadasivam from India proposes a novel vector quantiser design using Savitzky–Golay polynomial modelling in the wavelet domain. The transformed coefficients are subject to Vector Quantisation followed by Huffman Encoder. In the Quantisation process, initially a codebook is designed using an unsupervised greedy method. Obtaining an optimal

Statistical modelling scheme is not a trivial task and it is shown that the proposed approach can efficiently deal with it. Experimental results illustrate the real effectiveness of the suggested method both in terms of compression ratio and quality.

In the sequel, the paper by R. Satyabama and S. Annadurai from India proposes adaptive prediction and update techniques based on the local properties of images, in the framework of adaptive lifting wavelet schemes for image compression. A non-linear wavelet transform that adaptively chooses the number of vanishing and preserving moments in the prediction and update lifting steps according to the underlying local signal characteristics is presented. The spatial adaptivity criteria are based on the optimum interpolating function and minimum mean square error. This adaptive lifting transform appears promising for image compression applications.

Finally, the paper by Sabina Priyadarshini and Gadadhar Sahoo from India concludes this first issue for 2011 of IJSISE with a research on image representation. In this paper, a method of lossless compression of Freeman 4-directional chain codes as well as 8-directional chain codes has been proposed that brings about a compression ratio of 50% and 80% into 4-directional and 8-directional chain codes, respectively.

We believe that this issue illustrating interesting contributions in the design of important components of imaging and signal systems will be attractive for all practitioners and researchers. We would like to thank all authors as well as all reviewers and our publisher for their continuous support.

Finally, we would like to point out the increasing interest for special issues organisation, which reflects the increased interest for our journal. We depend with confidence on your quality proposals and research to advance the impact of this journal in the research community and business of signal and imaging systems.