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## Editorial

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**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 the 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.

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The third issue for 2011 of the *International Journal of Signal and Imaging Systems Engineering* (IJSISE) contains six stimulating regular papers, facing vital algorithmic and hardware aspects in signal and imaging systems evenly in theory and applications. Special care has been, also, taken for both timely publication of the accepted research papers, meeting all publication requirements, and diversity of the associated research groups so as to span as many different countries as possible. More specifically, the studies outlined in this issue cover interesting signal, image and video compression methodologies, new designs for implementing different modulation schemes for Software-Defined Radio (SDR), exciting new schemes for human tracking from video sequences as well as digital filtering improvements involved in the design of energy detectors.

Before proceeding with a brief presentation of the herein published research papers, it is our pleasure to announce to our audience that IJSISE, already indexed in SCOPUS and several other indices, recently got its first SCOPUS-related impact factors SJR (2010) and SNIP (2010) equal to 0.026 and 0.263, respectively. Needless to state, our efforts are focused on increasing the impact of this journal over the associated engineering research community.

The first paper by Thomas J. Hebert and Shruti N. Karulkar, from USA, has been invited by Professor Ahmad Taher Azar, Modern Science and Arts University (MSA), Electrical Communication & Electronics Systems Engineering Department, 6th of October City Egypt, Editor-in-Chief of *International Journal of System Dynamics Applications*, IGI-Global and Regional Associate

Editor of IJSISE. It presents an interesting pattern-tracking algorithm for lossless encoding of data, complete with a formal header format. This algorithm is based on the simple expectation that there exist patterns within a data set that re-occur with variations in amplitude. The proposed pattern-tracking algorithm is favourably compared with four standard lossless coding algorithms using numerous data sets from several different signal-processing applications.

In the sequel, the paper by Indranil Hatai and Indrajit Chakrabarti, from India, presents a new attractive design, in the context of SDR, for a low-power, high-speed, low-area parameter controlled Common Baseband Modulator (CBM) hardware architecture, which can perform Gaussian Minimum Shift Keying (GMSK) as well as Frequency Modulation (FM) schemes. The proposed research has adopted the common operator technique for parameterisation to bring in the benefit of relatively reduced hardware requirements. The whole design has been fully pipelined to achieve maximum operating frequency and is prototyped through FPGA implementation resulting in a quite efficient carrying out of the suggested concept.

The third paper by S. Amri, W. Barhoumi and E. Zagrouba, from Tunisia, scrutinises an important new approach aiming at tracking multiple moving people in a colour video sequence acquired with a single camera. The first phase of the approach consists in precisely detecting multi-human inside moving foregrounds. The input to this phase is foreground pixels corresponding to moving objects extracted from the scene using any background subtraction technique. These moving foregrounds are then further segmented into multiple moving people using region segmentation and shape-based occlusion handling. The second phase allocates the detected human blobs to tracks using a robust matching process based both on appearance model and on motion model involving a Kalman filter to predict future locations, as well as future sizes, for dynamic persons and fuse this information with appearance-based comparison to assign each blob to a track. This noteworthy approach has been tested on several representative indoor and outdoor video sequences. Preliminary experiments have shown that this unsupervised approach can robustly detect and track multiple occluded moving persons, even at lower temporal resolution.

The next paper by Tarek Ouni, Walid Ayedi and Mohamed Abid, from Tunisia again, illustrates an appealing video compression method, based on a 3D to 2D transformation of the temporal frames that allows exploring the temporal redundancy of the video using 2D transforms and avoiding the computationally demanding usual motion compensation step. This transformation turns the spatial temporal correlation of the video into high spatial correlation. Although the proposed codec offers several advantages, it results in some annoying artefacts. The authors present suitable extensions of the suggested scheme to reduce the perceived artefacts and increase the perceptual

as well as objective (PSNR) decoded video quality, which is actually competitive with that of the state-of-the-art video codec algorithms, especially when the low computational demands of the proposed approach are taken into account.

Jagroop Singh, Sukhwinder Singh, Dilbag Singh and Moin Uddin from India, in the fifth paper, investigate a novel frequency domain technique for image blocking artefact detection. The proposed algorithm is based on a new modelling function for blocking artefact detection in compressed images. The suggested blocking detection method reduces time and the computational load of deblocking algorithms by applying them only where needed. The authors' experimental results show that for all types of images, the suggested method of measuring blocking artefacts exhibits satisfactory performance when compared with other post-processing methods/techniques and is quite efficient and stable since the signals need not be compressed/decompressed.

Finally, Noha Shaaban, from Egypt, in the last paper of IJSISE V4, N3, proposes improvements in the design of CdZnTe (CZT) detectors, capable especially for portable gamma spectroscopy and safeguards applications, involving digital signal methods. The author claims that energy resolution of CZT is suffering from poor mobilities of charge carriers, which result in large signal shape variations depending on the interaction position inside the detector, and suggests a new scheme to enhance its performance. A suitable clustering technique has been used to classify and independently treat these shape variations. Prior to the classification process, a digital filter has been involved to remove noise from CZT signals. The filtered signals were classified using Maxi-Mini-Distance algorithm resulting in superior energy resolution performance.

We reckon that the current issue, signifying stimulating new contributions in the design of essential technologies for signal and imaging systems, covering diverse and vital relevant applications will be pretty tempting for practitioners, engineers and researchers. We would like to express our gratitude to all authors as well as all anonymous reviewers and our journal manager and publisher for their steady and huge support.

Ultimately, we are grateful to all authors and guest editors for the rising interest for high-quality submissions and special issues organisation at IJSISE in an increasing rate, doubling-up submissions when compared with previous years. Advancing the impact of this journal in the academic community and business of signal and imaging systems requires always your noteworthy contributions. Even if the pool of forthcoming papers is quite large and needs more than a year to be published, if we keep on at the current quarterly publication rate of IJSISE, we would like to assure you that we will do our best to timely but rigorously review and publish your important research reports scheduling them in terms of innovation significance and submission date but always without jeopardising timeliness of your contribution.