Foreword and Editorial

International Journal of Signal Processing, Image Processing and Pattern Recognition

We are very happy to publish this issue of an International Journal of Signal Processing, Image Processing and Pattern Recognition by Science and Engineering Research Support SoCiety.

This issue contains 39 articles. Achieving such a high quality of papers would have been impossible without the huge work that was undertaken by the Editorial Board members and External Reviewers. We take this opportunity to thank them for their great support and cooperation.

The research paper entitled “A Study on Partial Differential Equation Model of Image Denoising Method” puts forward an improved fourth order partial differential equation model, in order to overcome the contradiction between denoising and edge keeping, better denoising effect is obtained, and through the numerical simulation the results show that the method has good stability and practical value.

The dissertation about “Systematic Comparison of Linear Feature Extraction Methods for Classification of Hyperspectral Images with Noises” carried out a systemic comparison study of linear feature extraction methods for classification of hyperspectral images with various types of noises, in which the performance of different linear feature extraction methods for classification and their computation cost reduction are compared.

Authors of the paper “A Novel Solution to Test Face Recognition Methods on the Training Data Set”, present a method which can be used for face recognition or verification applications. The method can solve the problem that when the number of data categories is large and each number of the category used for training is small.

The study “Research Motion Blurred Image Restoration Algorithms” discusses the two kinds of classical image restoration methods: inverse filtering restoration, Wiener filtering restoration, authors give the principle and formula derivation of the algorithm.

The survey entitled “Survey on the Features for Recognition of on-line Handwritten Uyghur Characters” attempts to provide a detailed overview of the previous work on Uyghur on-line handwritten character recognition technology and mainly focuses on investigating the feature extraction algorithms that have been presented or applied to Uyghur characters.

In the paper “Consistency Maintenance of Group/Ungroup Operations in Object-based Collaborative Graphical Editing Systems”, based on Multi-Version strategy and Address Space Transformation method, a new MVSDR algorithm, which is not only applied to simple operations (such as Create, Delete, ChangeATT, etc.), but also suitable for Group/Ungroup ones, is proposed to solve the consistency maintenance problem.

The paper “Enhancement of Speech Signals in a Noisy Environment based on Wavelet based Adaptive Filtering”, presents the enhancement of speech signals in a noisy environment based on Wavelet Based Adaptive filtering (WAF). The investigation on
speech signals contaminated by noise has demonstrated that the performance of the proposed method is stable and reliable in the noisy environment.

The study entitled “One Sample Image Recognition Algorithm based on Improved Sub-pattern Principle Component Analysis”, proposed a one sample image recognition algorithm based on improved sub-pattern principle component analysis in order to improve the recognition performance of one sample image per person.

Authors of paper “Application in Face Recognition Based on Improved Local Linear Embedding Algorithm and Artificial Vector Machine” proposed a face recognition method of improved local linear embedding algorithm in order to improve the accuracy of face recognition in a variety of gestures.

Authors of the dissertation entitled “A Review On High-Dynamic-Range Imaging With Its Technique” presented a survey on High-dynamic-range imaging (HDRI or HDR) is a set of methods used in the imaging and photography to reproduce a superior dynamic range of luminosity than regular digital imaging or photographic methods can do.

In the study of “Tracking Multiple-person using Sparse Stereo Information”, authors address the problem of multi-person detection and tracking in challenging scenes using sparse stereo information. In each frame, only a sparse set of object feature points are extracted. All these feature points are then projected onto a plan-view map, and grouped into several clusters by employing the biometric information, the optical flow information of object feature points, as well as the width of a person. By producing clusters, the location of a possible person can be determined. In addition, a Modified Joint Probabilistic Data Association Filter (MJPDAF) is proposed for improving the performance of measurements association during the people tracking process.

The paper about “Survey on Digital Watermarking Techniques”, presents a literature survey on Digital Watermarking within an image. It describes the early work carried out on digital watermarks, including the brief analysis of various watermarking schemes and its applications. This paper also makes a comparison between various watermarking schemes. This paper also gives us a brief introduction about the procedure of digital watermarking.

In the dissertation about “Improved Carrier Frequency Offset Estimation Algorithms for PUCCH Format 1 in LTE-Advanced”, the carrier frequency offset estimation algorithms are analyzed, and a double-iteration carrier frequency offset (CFO) estimation algorithm is proved to perform the best for PUCCH Format 1 in high-speed mobile scenario. The estimation process is achieved by coarse estimation and fine estimation, which enlarges the estimation range and improves the estimation accuracy.

The study entitled “Spectral Color Reproduction from CIE Tristimulus Values Using a Node Address Array Selection Technique” proposes a feasible method for spectral color reproduction based on a node address array selection technique from CIE tristimulus values. Results show that the proposed method could reconstruct the spectral reflectance with a high spectral and colorimetric accuracy.

In the research paper “Role of Biquad and Hilbert Filters in Removing Noise – A Simulink Analysis” The Hilbert transform is widely known for its noise removal features; cascading it with Biquad filter produced better results. However, better results can be obtained by using adaptive filtering for speech signals [9]. The work done in this paper is
an analysis of both the filters and their role in removing noise from a particular category of signal.

In the paper “Visual Tracking Algorithm Based on Probabilistic Graphical Model”, a novel particle filter tracking algorithm based on graphical model is proposed in order to solve the temporal occlusion problem of target tracking.

In the study entitled “A 4th-Order Low-distortion Low-pass ΣΔ Modulator Using Timing-Sharing Technique”, a 4th-Order low-distortion low-pass ΣΔ modulator structure was proposed which uses the timing-sharing between the 3rd and 4th integrators during one clock phase. Compared with conventional cascade of integrators with distributed feed-forward (CIFF) sigma-delta modulator structure, the proposed structure not only solves the critical timing issue for the quantizer and feedback DAC path, but also eliminates an extra active adder to sum up the input feed-forward.

The thesis “Automated Fare Calculation in Delhi Metro Using Face Recognition” proposed a system is based on facial recognition that can be used by Delhi Metro System for easing up the process of fare calculation deduction system by means of automatizing the system using cameras placed at the entry gate, inside the metro rail and at the exit gate. This system will help in saving the man hours required for vending out tokens/ tickets/ smart cards in the metro system. This system will also increase the accuracy and will help in replacing traditional fare calculation activity which is perform daily.

In the article “Images Denoising and Enhancement Based on Dyadic Wavelet Domain Hidden Markov Models and Interpolation”, authors combine dyadic wavelet transform and hidden Markov tree (HMT) model, and propose an image edge enhancement method based on dyadic wavelet domain hidden Markov models and interpolation algorithm. Based on these analysis and criterion, recommendations for designing and setting backup stages distance relay protection are proposed.

The dissertation about “Recommendations for Setting Backup Stages Line Distance Relay Protection”, mainly analyze the technical actions to limit and expand the characteristics numerical distance relay protection in order to reduce losses and improve functioning protection, and considering the specifications, efficiency and losses of the backup stages distance relay protection on high-voltage lines.

The paper “EFP Structure Optimal Design for Satellite Attack through Air-space Platform” established a weapon system by installing EFP (explosively formed penetrator) warhead and the optimal design of EFP structure considering limited space and constrained posture adjust ability.

In the study entitled “Development of a High Precision Infrasonic Sound Sensor”, authors design a high precision infrasonic sound sensor based on PVDF, which is a new piezoelectric material of macromolecule with piezoelectric property.

In the paper “Face and Gesture Based Human Computer Interaction”, authors present a face and gesture based human computer interaction (HCI) system. They combine head pose and hand gesture to control the system.

Authors of study about “Brain Tumor Segmentation from Multispectral MRIs Using Sparse Representation Classification and Markov Random Field Regularization”, propose a fully automatic technique for brain tumor segmentation from multispectral human brain MRIs.
In the paper “Research on Signal Analysis Method based Wavelet Analysis and Grey Theory” wavelet analysis and grey theory are introduced into the signal analysis, a new signal analysis method based wavelet analysis and grey theory is proposed in this paper.

In the dissertation entitled “Lossless Image Compression using Differential Pulse Code Modulation and Its purpose” authors use differential pulse code modulation for image compression lossless and near-lossless compression method is introduced which is efficient due to its high compression ratio and simplicity. This method is consists of a new transformation method called Enhanced DPCM Transformation (EDT) which has a good energy compaction and a suitable Huffman encoding.

In the study “Research on Image Denoising with an Improved Wavelet Threshold Algorithm” a wavelet threshold denoising algorithm is put forward which is continuous based on the wavelet coefficients and differentiable and variable threshold value deviation. The experimental results show that this method has better denoising effect and has good practical value.

In the research paper “Analysis on Lane Detection and Departure under IPM” A method of structure lane detection and departure based on inverse perspective mapping (IPM) and effective gradient points is proposed. Experimental results show that the method can detect both sides lane and analyze departure and lane detection rate is 97.5%. The method can provide reference for lane departure warning system.

In the article “Performance Evaluation of Downlink Non Contiguous Carrier Aggregation in LTE-A” to achieve such high data rate in IMT-Advanced mobile systems, carrier aggregation technology by 3GPP has been introduced to support very-high-data rate transmissions over wide frequency bandwidth in the new LTE-Advanced standards. This work includes the details of Downlink LTE Advanced System Model and thereby all the performance analysis of Non Contiguous Carrier Aggregation are done and an overview of LTE-Advanced CA scenarios is discussed.

Authors of the study about “Research on Camera Calibration method based on Eight Parameter Model” proposed an eight parameters camera calibration model in order to reduce the complexity of the existing distortion correction method.

In the paper entitled “An Unambiguous Deterministic Compressed Acquisition Technique for BOC Signal” to achieve a fast acquisition of the GNSS signal with a reduced number of correlators and low computational complexity, a two-stage deterministic compressed (DS) GNSS acquisition technique has been proposed. The main idea of the proposed technique is to introduce a simplified GRASS algorithm in the second stage measurement.

In the paper “Performance Enhancement of Dynamic Cyclic Shift Code with Direct Detection and AND Subtraction Detection Technique of OCDMA”, the study of different parameters is based on conference a paper that is mainly demonstrated on an experiment to Enhancement a performance of DCS (Dynamic cyclic shift) code with their different parameter of OCDMA using optiwave system design tool.

Authors of the paper “Particle Filter Target Tracking Algorithm Based on MCMC Iteration Cubature” proposed a new improved particle filter algorithm called Iterated Cubature Kalman Particle Filter (ICKPF) in view of the problem of particle degradation and tracking accuracy in the standard particle filter tracking target algorithm.
In the paper “The Road Detection Technology of Vision Navigation for Picking Robot” the software and hardware of visual navigation system for car to walk is designed. Through processing the road image, the improvement of Hough examination method realized the extraction of path information; With the ultrasonic sensor for real-time detection of obstacle avoidance, making use of the fuzzy real-time controller monitoring for obstacle avoidance, AGV will realize the real-time obstacle avoidance effectively during the car walking. Experimental result shows that the maximum error of the visual navigation is 1.5cm when the car walks in a straight line. The maximum error for curve walking is 6cm, and the success rate of obstacle avoidance reaches 96.67%. The study provides technical support for the walking robot’s visual navigation.

Paper “A Kind of Timing System Based on Beidou Satellite Navigation System” sets up a timing hardware circuit with the platform using the BDS receiving module UM220 produced by Hexinxingtong company, based on analyzing the BDS’s functional features and timing principles, and presents the implementation of computer terminal timing software and its operating process.

Paper “Face Recognition based on Improved Robust Sparse Coding Algorithm” proposed a novel face recognition method based on improved robust sparse coding algorithm (MRCS-ELM) to solve the defecting of traditional sparse coding algorithm.

Authors of the research paper “Design and Optimization of Rectangular Microstrip Antenna for UWB Applications” proposed a novel rectangular microstrip antenna for ultrawideband applications.

In the paper “Research on Image Nonlocal Denoising Algorithm based on Wavelet Decomposition” image signal can be divided into high frequency and low frequency part using wavelet decomposition, nonlocal denoising algorithm is used in low-frequency approximate signal, for high frequency detail signals using wavelet filtering method for denoising. The experimental results show that the method improves the speed of image processing and has good practical value.

In the paper “Study on Recognition Method of Adhering Bars Based on Support Vector Machine” a new solution to the problem of bars adhesion is proposed: a support vector machine is constructed to recognize the adhesion type of bars by the feature vectors of training samples.

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Editor of the September Issue on International Journal of Signal Processing, Image Processing and Pattern Recognition