Foreword and Editorial

International Journal of Hybrid Information Technology

We are very happy to publish this issue of an International Journal of Hybrid Information Technology by Science and Engineering Research Support soCiety.

This issue contains 35 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 paper “An Improved Strong Tracking UKF Based on Fading Factor” presents an improved STUKF algorithm. Compared with the traditional STUKF filter, this new algorithm introduces the formulas of redefined fading factor. By changing the position of the fading factor, it improves the accuracy and robustness of the algorithm and reduces the computational complexity of the algorithm.

The paper “Multi-soliton Solutions for a Class of Fifth-order Evolution Equations” investigated a class of generalized fifth-order KdV (gKdV) equations which arise in nonlinear lattice, plasma physics and ocean dynamics by employing a simplified bilinear method. With the aid of symbolic computation, both solitary wave solutions and multiple-soliton solutions are obtained. These new exact solutions will extend previous results and help us explain the properties of nonlinear solitary waves in many physical models in shallow water.

Paper “Bessel Function Self-Feedback Chaotic Neural Network Model and Applications” proposed a new chaotic neural network model, it introduces a Bessel function as self-feedback term in this model, Compared with other chaotic neural network model, owing to the Bessel function is a nonlinear function with good nature, and it has stronger function approximation ability, so that the novel chaotic network model has stronger traversal search ability.

The paper “Cloud-Based Synchronization for Interface Settings for Older Adults” explore the features such a cloud storage system would need to consider, in order to bring interface settings together across a variety of connected devices and keep computers up to date with the users’ preferred interface.

The paper “Construction and Application of Performance Prediction Model for Aerobics Athletes Based on Online-SVM” proposed an online support vector machine (OSVM) modeling aiming at the problems that the predictive model is often mismatching and difficult to solve the nonlinear optimization function of nonlinear system model of predictive control. This proposed method builds a nonlinear model for objects using OSVM.

Paper “A Research on Join Points-Capture in Method and Object by AspectJ” achieves information-capture of join points by analyzing Java program with AspectJ. This information includes: method call, parameter values passed in method call, captured value of reference
“this” when method is executed, the time when this references a specific type problem, and the time when the target object of the join point is a specific type.

In the paper “Gear Box Fault Diagnosis using Hilbert Transform and Study on Classification of Features by Support Vector Machine”, proposes a fault detection method that combines Hilbert transform and machine learning method namely support vector machines (SVMs). The statistical feature vectors from Hilbert transform coefficients are classified using J48 algorithm and the predominant features were fed as input for training and testing SVM and their efficiency in classifying the faults in the Bevel Gear Box was studied.

The paper “Trustworthy Construction Approach of BPR Software System Based on Semantic Model Verification” proposes a trustworthy construction approach to solve the problem mentioned above addressing to improve the trustworthiness of Business Process Re-engineering (BPR) system. Firstly, it analyze related literatures about the topic, it realize that main reason causing to reduce trustworthiness of BPR system is due to break of trustworthy connectivity between front configuration tools and business processes operating server. Secondly, as the primary methods composing of the construction approach, a semantic verification method is illustrated in detail based on Petri net.

In the paper “Parallel Compression and Decompression of DNA Sequence Reads in FASTQ Format”, presented the parallel compression and decompression methods for DNA sequence reads in FASTQ format based on the parallel computer architectures of the cluster and the SMP. Experimental results for PDSRC clearly showed the efficiency of these parallel methods. The speedups vary from 46 to 62 for parallel compression and vary from 40 to 58 for parallel decompression by using 10 nodes of cluster in Tianhe-1A super computer. Test results on the SMP machine are also pleasant.

In Paper “Modern Control Techniques in Wind Turbine”, provide an overview of basic wind turbine control systems and highlight recent industry trends and research in wind turbine control systems for grid integration and frequency stability.

The paper “GIS: Assessment Model and Evaluation of an Earthquake-stricken Area with a Case Study in Shangri-La” assesses the area of destroyed houses, economic loss, the number of earthquake deaths and number of homes lost using multiple models-a building earthquake death model, a destroyed houses model, an economic loss model and a homes lost model. This inturn allows the distribution pattern of the various losses to be displayed on a map by integrating the evaluation model and GIS technology. The value of spatial distribution is more important than simple statistical data as spatial distribution helps us understand the distribution of earthquake damage thus allowing targeted command decisions to be made for technical support of earthquake victims and earthquake-affected areas.

In the paper “Privacy-Preserving Proximity Based Services”, propose a privacy-preserving query method, which successfully provides more precise proximity services and solves the location privacy issues on 3D smooth surface. In this paper, it introduces the geodesic distance and put forward a more precise proximity range measurement method based on the triangle fractal. Based on this, a privacy-preserving proximity query protocol is proposed to provide complete privacy with respect to the SP and the buddies.
Paper “Assessment of the Influence Process Parameters in the Friction Stir Welded Mechanical and Corrosion Properties of AA5754 Alloys” deals with the in-depth analysis of the influence of the process parameters have been performed using Taguchi method. Through the optimization of the process parameters it has been observed what the best process conditions for the different mechanical properties.

The paper “Self-Optimizing Evaluation Function for Chinese-Chess” presented a new method of optimizing evaluation function in Chinese-chess programming by particle swarm optimization. The process of training evaluation function is to automatically adjust these parameters in the evaluation function by self-optimizing method accomplished through competition, which is a Chinese-chess system plays against itself with different evaluation functions.

The paper “Information Fusion Predictive Control Algorithm for Time-Varying Systems with Unknown Stochastic System Bias” puts forward on a fast distributed information fusion predictive control algorithm for the time-varying system with unknown stochastic system bias. It is based on the distributed fusion estimation algorithms and state-space model. The optimal information fusion rule for this algorithm is weighted by matrices, diagonal matrices and scalars.

Paper “Image Encryption Based on 2-D Zaslavskii Chaotic Map and Pseudo Hadmard Transform” proposed a novel approach for image encryption based on a 2-D Zaslavskii map and Pseudo Hadmard transform. The encryption process is composed of two stages, i.e. permutation and diffusion. The permutation is achieved by scrambling rows and columns using chaotic values. This stage substantially reduces the correlation between neighboring pixels. During diffusion, the avalanche effect is achieved with 2-D Pseudo Hadmard transforms followed by diffusion in two directions (forward and backward) with multiple additions and xor operations. This stage ensures resistance against differential attacks. The security and performance of the proposed method is analyzed thoroughly by using key-sensitivity, key-space, statistical, entropy, differential and performance analysis. The proposed scheme achieves the required level of security with only one round of encryption operation.

In the paper “A Modified Wavelet Neutral Network Model for Measuring Goodwill”, propose to employ Genetic Algorithm (GA) for optimizing the initial parameters before model training. On the other hand, the training cost of basic WNN is typically big and its convergence speed is relatively slow. To accelerate the convergence speed, it introduce Levenberg-Marquardt (LM) algorithm for training.

The paper “Cordic Iterations based Architecture for Low Power and High Quality DCT” presents low-power co-ordinate rotation digital computer (CORDIC) based reconfigurable discrete cosine transform (DCT) architecture. All the computations in DCT are not equally important in generating the frequency domain output. Considering the important difference in the DCT co-efficient the number of CORDIC iterations can be dynamically changed to reduce the power of consumption with improved image quality.

The paper “Design and Analysis of Efficient Pulse-driven Magnetically Coupled Resonant Wireless Power Transmission System” provides a thorough investigation of the principle of magnetically coupled resonant wireless power transmission. Parameters which contribute to
the load power and transmission efficiency are analyzed through theoretical derivation of the circuit model. Furthermore, on the basis of such analysis, experimental devices of transmitting and receiving are proposed.

The paper “A Novel Defogging Technique for Dehazing Images” proposes a new technique which overcomes the disadvantage of DCP and at the same time preserves the picture quality. The proposed method is implemented in MATLAB-09 and the simulation results show the proposed method is quite good.

In the paper “Research on the Improvement of Traditional Linear Weighted Algorithm for QoS-based Web Service Selection”, proposes a new QoS-based algorithm developed from traditional linear weighted algorithm for web service selection. The main improvements include removing distinction of QoS properties value tendency, selecting fixed value and a hybrid subjective-objective approach to set the weight of each QoS property. It also presents the analysis of the time complexity.

In the paper “Gamifying Intelligent Daily Environments through Introducing Fictionality”, proposes some design patterns to integrate fictional stories into the real world for gamifying intelligent daily environments. The proposed design patterns cover three aspects. The first aspect is to exploit visual reality. The second aspect is to exploit ideological messages in fictional stories. The third aspect is to compose multiple fictional stories. The paper also shows a case study to motivate and gamify to join the Haiku contest by increasing the awareness of the importance of the contest, and show the effectiveness of the proposed design patterns.

In the paper “The Research to Regular Sequences of Similar Algorithm Based on Sparse Linear”, specified that the HR algorithm can be used to solve the scheduling problem of concurrent open-shop; also, the calculation flow and algorithmic ordering process have been presented. According to the calculation and demonstration, the maximum error of manufacture period of HR algorithm $a_c$ is 2, the maximum error of total completion time $-a_c$ is $2m$ (m is the number of machine).

The paper “A Kind of Chaotic Particle Swarm and Fuzzy C- mean Clustering Based on Genetic Algorithm” proposes a new clustering algorithm that combines genetic algorithm and chaotic particle swarm optimization with fuzzy C- means (GCQPSO-FCM), in order to solve the issue that the fuzzy C- mean algorithm is sensitive to the initial value. First, make full use of genetic algorithms to calculate the optimal number of clusters of sample population and select a valid criterion function as a fitness function; Furthermore, introduce chaos strategy in particle swarm algorithm to improve the algorithm global search ability, also contribute to the particles are more easily jump out of local bondage. Two speed factors are defined to accelerate the convergence, which also improves the performance of the algorithm.

The paper “Impact of Distributed Generation and Series FACTS Compensator on Directional Overcurrent Protection Coordination” investigated the impact of installing Distributed Generation in radial system on the directional over-current protection relay, in presence of a Thyristor Controlled Series Capacitor on fault courant. The relays coordination scheme was developed through analysis for three fault location scenarios. A realistic feeder system for a case study with its scheme protection is developed in Matlab software environment.
Paper “Mining Users’ Similarity from Moving Trajectories for Mobile E-commerce Recommendation” explores the problems in the existing mobile e-commerce recommendation methods, and proposes a mobile users’ moving trajectories mining based user similarity discovering approach for mobile e-commerce system. It formally defines the moving trajectory and views the areas, where users stay within for a certain time, as interested regions, which reflect the preferences of mobile-device-holders. Based on the number of overlapped interested areas, a user similarity measure method is proposed.

In the paper “Performance Analysis of OFDM Based Cooperative Communication over Nakagami Fading Channel”, derives the carrier to noise interference ratio (CNIR) and average bit error rate (BER) for orthogonal frequency division multiplexing (OFDM) based amplify and forward (AF) and decode and forward (DF) scheme over Nakagami fading channels.

The paper “An Improved Evolutionary Strategy of Genetic Algorithm and a New Method on Generation of Initial Population When Using Genetic Algorithms for Solving Constrained Optimization Problems” provides an improved evolutionary strategy (ES) of genetic algorithm (GA) on the basis of the existing literature. The ES overcomes the shortage of traditional GA whose excellent child individuals obtained in the crossover process may not survive in the process of mutation. In addition, the crossover probability and mutation probability which is hard to determine in traditional GA is removed for this proposed strategy. At the same time, it increases the number of individuals produced in process of crossover. This may increase the possibility of producing excellent individuals, thus lead to better improvement of the traditional GA. The test result of finding the optimal values of four functions using transitional GA and the proposed GA is presented in this paper.

The paper “A Novel Compact and Wideband Multi U-Slotted Microstrip Antenna” presented a new compact and wideband multi U-slotted microstrip patch antenna with improved bandwidth. The antenna is resonating at the center frequency of 4.2 GHz with return loss of -40 dB. The proposed antenna provides an impedance bandwidth of 110% and VSWR ≤ 1.02 which is close to unity. The proposed antenna is excited by coaxial feed and analyzed by using HFSS software. The proposed multi U-slotted microstrip antenna is suitable for Bluetooth, Wi-Fi, WLAN, WiMax wireless communications.

Paper “Retinex Algorithm on Changing Scales for Haze Removal with Depth Map” proposed a Retinex algorithm based on the changing scale for haze removal with a depth map in order to improve the traffic visibility in haze weathers. It requires the haze image dark channel prior treatment to obtain the estimated depth map. Then it is according to the depth map to calculate Retinex scales for different parts of a hazy image. Finally a single scale Retinex transform is performed for each part of the image.

The paper “An Aspect-oriented Software Architecture Description Language AO-ADL Based on XYZ” promotes the concept of AOP at coding phase up to software architecture by adding Aspect into XYZ/ADL and adding aspect role in connector for dealing with the interaction between aspect and component, and proposes the related composition mechanism so as to form the Aspect-Oriented Architecture Description Language (AO-ADL).

In the paper “Software Outsourcing Partnership(SOP): A Systematic Literature Review Protocol with Preliminary Results”, presents the SLR protocol for the identification of factors
for building or maintaining software outsourcing partnership between client and vendor organizations. The ultimate goal of this research is the development of SOPM. The SLR is the first phase in the development of the stated model.

Paper “Border Detecting Method for IR Image of Fire Extinguishing Agent Dispersion” employed an edge detection method based on Canny operator and dynamic textures, aiming at the low contrast of infrared imagery when fire extinguisher dispersing. Because of the significant difference between dispersion region texture and background, dynamic textures method based on Fourier transform is used for pre-segmentation of dispersion area and detecting the edges. Infrared imagery can be well treated by this method.

The paper “Analysis of Spots for Helicopter Saving in Mountain Area by Using GPS” analyze the spots for helicopter to land and take off when accidents occur on the mountains by using GPS to support decision-making for emergency saving system. The target area for this study was limited to Pucheon, Gyeonggi-do, in Korea. The spots for saving were classified into two such as landing spots and take-off spots for helicopter to respond to the emergencies on the practical site. Digital map, forest type map, and forest soils map were used as fundamental data. This study was performed excluding factors such as direction of the wind, speed of the wind, etc.

In the paper “Spatial-temporal Indexing Research based on Road Network: Improved-MON-tree” proposes an improved the indexing mechanism Improved-MON-tree on the basic of the Mon-tree. The index structure of the upper edge of the organization, the lower route-based organization, and added in the lower trajectory of moving objects.

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