Foreword and Editorial

International Journal of Multimedia and Ubiquitous Engineering

We are very happy to publish this issue of International Journal of Multimedia and Ubiquitous Engineering by Science and Engineering Research Support soCiety.

This issue contains 33 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.

Authors of the paper "A Fuzzy Neural Approach with Multiple Models to Time-Dependent Short Term Power Load Forecasting Based on Weather" presents a new adaptive neuro-fuzzy inference system (ANFIS) approach with multiple models to predict time-dependent power load values based on the weather data collected from different regions. The results show that averaging the predicted values of 10 repeated runs generates the best prediction results using average weather data as input variables. Thus the load curves with more repeated runs have better general performances. In addition, the load curves on holidays show better predictability than those on work-days.

In the article entitled "Tree Based Localization Model for Line Following Robots", today automated frameworks are broadly utilized as a part of the business specifically for assignments, for example, welding, painting and bundling. All of these automated systems are in the form of manipulators that carry out repetitive motion. For large scale transportation such robotics systems are not particularly practical and therefore automatic transportation systems have been developed either as numerically controlled systems like automatic warehouses or through use of automatic guided vehicles (AGVs). Almost all AGVs use a guide-path system where they track a buried Wire on the floor or utilize other forms of artificial landmarks. In this paper they design an algorithm for a line follower based service robot which could be applicable to various practical automation systems. Here, a new localization algorithm has been proposed to localize the mobile robot in an area.

In the paper "A Node Importance Analytical Approach for Multiple Relationships Online Social Network", multiple relationships online social network node importance analysis was proposed based on signaling process, and considering the characteristics of multiple relationships which would interrelate with each other. The novel approach has been approved to be efficient by experiments described in this paper, and can improve efficiency of the analysis of public opinions, community structure detection and information propagation.

In the research paper entitled "A Visualization Technique of a Music Emotion Represented in Dimensional Approach on Infinity Mirror Based LED Wall", authors propose a visualization method of a music emotion on LED wall. Emotion in music is recognized by a suggested algorithm using a dimensional approach. The algorithm overcomes some shortcoming of Thayer's model in detecting emotion in a one-second music segment. Moreover, IRI color model is combined with Thayer's model to determine LED light colors corresponding to 36 different music emotions. They are visualized through colors and animations on LED wall. The accuracy of music emotion visualization achieved to over 60%.

The study "Measure Audiences' Satisfaction through User Generated Content–Satisfaction Research in Motion Picture Industry" mainly explores the possibility that to measure film audiences' satisfaction level based totally on user generated content with PLS-SEM. The result displays excellent reliability, validity and predictive relevance. Besides, factors that contribute to audiences' satisfaction are scrutinized in this work. It can supply some meaningful implication to film distributors, exhibitors and future relative research.

In the paper "Identifying Effectiveness of Supply Chain Management Using Fuzzy Customer Feedback System", the product quality is an important aspect that directly affects the supply chain management. The production of low quality products in the market leads to failure in their operational mode. This hurts the trust of customers on the company and creates a bad image of company in the market. The continuous degrade in the quality may lead to a big financial loss in the company. In this paper an approach related to the generation of an index to a particular company that can be used further in the supply chain management strategy change. The proposed system is implemented using Fuzzy System using FISPro, open access software tool.

In the article "Neighborhood Upper and Lower Approximation for the Content-Based Image Retrieval", In order to solve the problem that the dimension disaster caused by high-dimensional features seriously affects the efficiency of the content-based image retrieval, this paper presents a method for generating an image retrieval algorithm with neighborhood rough set. By introducing the upper and lower approximation definition of neighborhood rough set, the proposed algorithm achieves the features selection and similarity measurement for automatic image retrieval.

In the research paper "Intelligent Garbage Collection Policy Based on I/O Workload Prediction for NAND Flash-based Storage Devices", NAND flash memory exhibits a large number of advantages such as high random access performance, small size, high reliability, and strong shock resistance, it has been widely used as the dominant storage device for consumer electronics. However, NAND flash memory uses an out-of-place update scheme to solve its erase-before-write hardware constraint and then garbage collection operations should be performed to reclaim invalid pages that are incurred by its out-of-place update scheme. Garbage collection operations usually incur high garbage collection overhead and shorten the lifetime of NAND flash memory. In this case, this paper proposes an intelligent garbage collection policy based on the I/O workload prediction for NAND flash-based storage devices. The proposed intelligent garbage collection policy adopts an improved exponentially weighted moving average method to predict the I/O workload and determines the number of victim blocks that should be reclaimed. In order to lower the degree of wear leveling for NAND flash memory, the proposed intelligent garbage collection policy first reclaims young victim block candidates with low erase count.

The study entitled "Opinion of Startups in Exemplifying Role of Business Incubators in Sustaining their Survival and Growth: Empirical Evidence from Pakistan" aims to explore how business incubators provide different facilities to startups and the effectiveness of these services and facilities. Business incubation systems in Pakistan are in their early stages and face several issues. This study focuses on developing a better understanding of business incubators. The standardized questionnaire technique is used to gather information on all areas of concern pertaining to startups by focusing on their survival and growth. The scale used in the questionnaire is the five-point Likert scale.

In the paper about “Optimal PMU Placement Method Based on Node Failure Rate and Its Application in Daqing Oilfield Power”, not considering the reliability of components, generally, PMU optimal allocation results weren’t taken fully account of the possible failure of the grid elements. Based on fully considering the reliability and economy, this article proposes the method of optimal PMU placement by combining the node failure rate and the completely observability of system as constraints. While trying to improve and combine Differential Evolution(DE) Algorithm and Shuffle Frog Leaping Algorithm(SFLA), use speed update strategy and global searching ability of DE algorithm to avoid low accuracy and easy to fall into the local optimum in dealing with problems, in order to improve the performance of the algorithm. Primarily, considering the node failure rate as constraint in the optimization processes to guarantee the global optimal solution of the power system, at the same time to make the numbers of PMU least.

In the paper “Design and Optimal an Object Tracking Method based on Hybrid Templates: Experimental Analysis of Video Sequences”, to improve the robustness of object tracking method, the study on tracking method based on sparse representation is done in the paper, and a new object tracking method based on hybrid templates is proposed. The sparse representation of global template to candidate target generates reconstruct error, and the sparse representation of local structural sparse dictionary to candidate target generates similarity function. The optimal discriminate result of the logistic decision function which combine two models regard as tracking result, the experimental results and analysis demonstrate the performance of the proposed method.

Paper entitled “Minimum Interference Resource Allocation Algorithm for D2D in C-RAN Architecture” stated that in order to solve the problem of supporting resource allocation of D2D in C-RAN architecture, Minimum Interference Resource Allocation (MIRA) is proposed by using the centralized processing of C-RAN to obtain the mutual interferences among users. The proposed scheme takes the minimum aggregation of mutual interferences among users as the target to construct the optimization mathematical model, and then to achieve the optimal solution.

The paper “Analysis of Slow Motion Based on Adaptive Detection Method in Tennis Video” select the tennis video which has logo transition both at the beginning and the end of slow motion as research material. An adaptive threshold based slow motion replay detection method is proposed. This method solves the problem of adaptively selects threshold in the process of slow motion replay detection. Unlike previous approaches, this method has great improvement in both precision rate and positioning accuracy of the boundaries, and can be used for other sports videos which also have logo transition.

In the study entitled “Smart City Based Mobile Application for Seamless Communication of Differently-Abled”, the proposed research based mobile-application development is to aid the needs of the differently-abled (deaf and dumb) community. This application inherits the core design of artificial intelligence that eliminates the language barrier faced by the differently – abled people. The progressive features imbibed in this application would craft a revolutionary impact in their lives which would carter their needs cleverly. The base work of this application is to translate the static sign language into text that is understood by all. The application is implemented in Android operating system platform, which has the mode for wider usability of the application. The primary goal of this work is to detect and recognize the hand signs of deaf and dumb people trying to communicate and convert that into understandable text. The detection is a dynamic process since it is based on color and it can be varied in-line to the lighting conditions of the user. On the identification of the sign displayed by hand, it will be recognized by initiating the mobile

application preprocessing techniques. The preprocessing technique involves attributes like conversion to HSV, and then to a binary image.

In the paper “Study on a Multi-Hierarchy Topological Sort Algorithm for Automatic Calculation”, topological sort algorithm (Toposort) is widely used for practical problems. However, standard toposort don’t solve the automatic calculation of formula problem (ACFP) directly. To gain the feasible topological order of ACFP, this paper puts forward a modified algorithm based toposort ,which models for ACFP using directed acyclic graph (DAG) firstly, and then puts the 0 in-degree formula nodes into a level list in execution process, lastly decreases the in-degree of other formula nodes ,whose parameters is correlate to the 0 in-degree nodes and in-degree is not equal to 0.Application of the modified algorithm in ACFP with 183 formulas, their system achieves a feasible topological order and uses the order and reflection mechanism to gain the final correct result. Compared to the customer's manual calculation, their algorithm spends a little time but achieves the same results.

In the paper entitled “Action Recognition Using Motion History Image and Static History Image-based Local Binary Patterns”, Human action recognition is an important yet challenging task. In this paper, they propose a robust and effective framework to largely improve the performance of human action recognition using depth maps. The key contribution is the Motion History Image (MHI) and Static History Image (SHI) is used to represent depth sequence. And they optimize the condition to construct the MHI and SHI; it allows us to capture more critical information. The local binary pattern (LBP) are then computed to gain the compact feature representation of an action. they evaluate the proposed framework on MSR Action3D dataset.

In the study about “Server Consolidation Using a Dynamic Model Approach”, the vigorous increase in the applicability of services through Cloud Computing has brought up major concern about management of a large number of servers supporting virtualization consuming high power. In respect of this, Server Consolidation approach leads to the reduction of these multiple numbers of servers into a very small count without any compromise in Quality of Service (QoS). Server consolidation manages the servers without degrading the services offered which needs to be revised timely in order to cope up with present high growth technological scenario. The paper considers the optimized server consolidation problem and proposes a Dynamic Server Allocation Problem (DSAP) model in contrast to Static Server Allocation Problem available in literature. The DSAP can afford the dynamic requests along with the ability to support parallelism.

Paper “Efficient Audio Noise Reduction System Using Butterworth Chebyshev and Elliptical filter” states that digital signal processing is widely used to manipulate, modify, enhance or filter signals such as speech, audio, image and telecommunication signal. Signals can be processed in the analog domain, but the digital domain offers high speed, better accuracy, greater flexibility increased storing capabilities and simple implementation. The audio signal noise reduction has become a fundamental area of research for many real world applications. There are two forms of filters one is fixed, and another one is tunable. Fixed filters measure those within which passband frequencies and stop band frequencies, square measure mounted whereas just in case of tunable filters, passband and stop band frequencies measured variable. These frequencies will be modified consistent with the need of the applications. Tunable digital filters are widely used in medical electronics, digital audio instrumentation, telecommunications and control systems. It is often the essential requirement for removal of noise from the audio signal.

In the paper “Performance Analysis of 2D NoC Topologies using Booksim 2.0”, NoC is an advancement of bus interconnect technology which reduces the communication bottleneck of multicore System-on-chip when the number of IP core increases. NoC interconnects various components such as processors, controllers and many other IP core in such a way that there is an optimal utilization of resources. In this paper, they focused on the evolution of NoC and they have evaluated the performance of most popular NoC topologies like mesh, torus, c-mesh, fattree on various parameters like injection rate, latency & throughput.

The paper “Modeling and Designing Autonomous Control Law for Eight-Rotor UAV” focuses on two points: one is the details of the dynamic and kinematical model for the eight-rotor Unmanned Aerial Vehicle (UAV) which utilizes an innovative Eight-Rotor design from RCToys which has made; the other is the design of an autonomous flight control law for the Eight-Rotor Unmanned Aerial Vehicle (UAV). The approach of designing this law is decentralized in nature by incorporating the composite nonlinear feedback control, together with dynamic inversion. The overall control law consists of the core control part and command generator part. The function of the core control part is to guarantee the asymptotic stability of the Eight-Rotor UAV motion with respect to the surrounding air. The role of the command generator is to produce flight commands or references for pre-scheduled flight tasks or flight missions.

Authors of the paper “Parallel Coordinates for Visual Analytics of Vehicle Navigation Area” present a parallel coordinates of visual analytics technique, by taking advantage of parallel coordinates and time series plots. An application of its performance is proved on datasets associated with vehicle. Its performance include data selection, dimension transfer, color transform, plot inter-conversion, dimension zoom, dimension control of combination of parallel coordinates, and replace, display, append of time series plots. Furthermore, parallel coordinates of visual analytics can visually describe the similarity dimensions datasets associated with vehicle navigation area, and time series plots may be as an auxiliary means to further promote understanding and analysis of the correlations between involving vehicle properties, as well as it can visually depict any of two properties, specifically, with time as the horizontal axis, It is demonstrated that these measures present a promoting visual understanding for user to find an important attribute of vehicles, involving possible accidents in a certain period or stage.

The paper “A Critical Insight into Congestion Control Mechanism in WSN”, states that the wireless network leads towards the unpredictable network load due to the event-driven nature of WSN. The sensors may densely distribute in different areas i.e. in the Forest, in militaries and etc. The sensor nodes carry all necessary components for transmission and reception of data packets. During the transmission, the data packet may be lost due to the congestion at single node. In this paper, they review, classify and compare the approaches of various congestion control mechanisms through which the issues have been fairly controlled based on assumptions and results provided by various researchers.

The paper “Research on Video Game Scene Annotation in Basketball Video” is mainly researching on the basketball match video annotation. In the process of annotation, shot is the process unit, which boundary detection has high priority. This paper detects the shot boundary based on the difference between the histogram of key region. In the contracture of the sports video, scene’s level is higher than shot’s and it can be obtained by clustering shot into different classes. RFCM cluster can be used to classify the shots and annotate the scene.

The paper “Three-dimensional Chained Nonholonomic Systems Stabilization Control via Dynamic Feedback” states that three kinds of global universal controllers are proposed for nonholonomic systems, namely, the universal exponential regulators, the universal K-exponential controller and the universal practical controller. With help of an introduced state and the dynamic feedback technique, a controller with special structure is constructed to obtain an augmented closed-loop error system. The error system tends to continuous oscillation. So the controller structure is modified to loosen the control objective to practical stability and the error can converge to a neighborhood of origin as small as possible. Thus, oscillation and peaking phenomena are avoided and engineering precision is obtained.

The study entitled “Data Transfer and Wireless Changing Over Electro Magnetic Field” have proposed an electromagnetic induction based system for short range wireless data transfer and wireless charging as an alternative to Wi-Fi and other conventional wireless techniques especially for data transmission to mobile phones and hand hold devices. they have already seen the advancement in the field of wireless charging of mobile phones now with help of their proposed model they can also incorporate the feature of data transmission in the same module used for wireless charging. their system utilizes the property of induction that when an input pulse changing the magnetic flux is applied at the transmitter then a similar pulse with 180 degrees phase shift is received at the receiver. By utilizing this method they can effectively transmit data (in short range) with quite a cheap circuitry.
Authors of the paper “Analysis of Physical Education Teaching Mode Based on Computer Multimedia and Network System” analyze physical education teaching mode based on computer multimedia and network. In the network environment, physical education has an advantage in the educational function and resources, and provides learners with a modern teaching environment. Through a questionnaire survey, 74.2% of the students said that the effect of multimedia teaching was significantly higher than the traditional physical education, 63.1% of students agree that computer assisted instruction can stimulate interest in learning. At the same time, they find out the problems existing in the teaching of physical education, and provide some suggestions.

In the paper “Multimedia Retrieval and Search Ranking Based on Domain Ontology”, Multimedia plays an important role in today’s IT world. Over the past few decades, a lot of research has been done for retrieval of multimedia content and annotation for semantic web. they present a framework for multimedia retrieval and search ranking strategy which exploits descriptive metadata as well as domain ontology. It supports semantic retrieval by combining ontological concepts and textual features extracted from annotation. In this paper a query processing model including a semantic expansion schema is used to extend the meaning of the user query, which aims at retrieving multimedia objects semantically.

In the study about “Clock Synchronization in IoTs Network through Cloud”, the Internet of Things is a trending future technological revolution that emerging distributed computing and real-time based application and its development depends on dynamic technical innovation in a number of important fields from wireless sensors to nanotechnology. Cloud integration with IoT made things more convenient and easy. Clock synchronization between a system in a distributed network is the complex and tedious job. It is mandatory to get sync with other and source as well. There are many proposed ways of data synchronization protocols like NTP, GPS (Global Position System) to maintain sync process between Systems or IoT devices network. In this paper, they are proposing a clock synchronization approach to sync clocks between IoTs and Cloud which are connected with each other in distributed network. Here they have used cloud service SaaS (Software as a Service) to collect the information to analysis and trigger the

results action to IoTs. In this paper, they present the Clock Synchronization based on Precision time protocol(PTP) between IoTs Simulation model for Omnet++ with INET framework, which allows us to check clock sync accuracy with a different network configured topologies. they have tried to minimize the clock drift with clock offset updating and with master-slave phenomena also minimize the master-slave delay.

Paper “Research on the English Teaching and Autonomous Learning Based on Multimedia Platform and Smart Classroom System”, with the development of technology and the popularization of computer media, information technology is playing a more and more important role in foreign language teaching. In this paper, the author analyzes the English teaching and autonomous learning based on multimedia platform and smart classroom system. Intelligent classroom is a wireless ubiquitous network access environment, students can use wireless terminals for interconnection, and student could carry out group discussions and cooperative learning according to the needs of learning. The multimedia classroom provides a more authentic language environment for English teaching. In the teaching process, it can better stimulate students' interest and participation in learning, make independent learning really possible. Through the analysis of English autonomous learning based on multimedia platform, the author puts forward the related English learning strategies.

In the paper “Sense-Based Information Retrieval Using Fuzzy Logic and Swarm Intelligence”, improvement of the quality of information retrieval (IR) using the word sense disambiguation (WSD) was subject of controversy among a lot of authors. However, the recent researches pay tribute to the positive role for using the WSD to improve the IR systems. Query expansion is one of the means to improve the IR using the WSD. Many authors reported that the insertion of synonyms into query after exam the best senses improves the IR quality. However, there are two problems still facing IR systems based on sense, the first is the extent of WSD accuracy, and the second is the delay when addressing a large-scale document collections. This work aims to develop an innovative model to address these two problems. It uses the fuzzy logic to improve the WSD accuracy through tuning the synonyms weights while uses the swarm intelligence, specifically the artificial bee colony (ABC) approach, to address the latency problem.

In this paper “Analysis on University Education Reform and Teaching based on Computer Multimedia and Network Teaching Platform”, the authors analyze university education reform and teaching based on computer multimedia and network teaching platform. It can be seen that the most universities have implemented the multimedia teaching; the teaching mode has changed from the traditional teaching mode to the modern teaching mode. In terms of curriculum planning, teachers can use the network teaching platform and teaching courseware to complete the teaching. In terms of learning support, the platform could provide a variety of common support tools, such as online classroom, answering system.

In this paper “WME-KSVD Dictionary Based Distributed Compressive Video Sensing”, it propose a novel adaptive-weighted side information extraction method is proposed to improve the reconstruction video quality. First, the similarity of the measured values between CS frame and the key frames is calculated. Then the weighted factors are decided according to the calculated similarities. The two key frames which have been made motion estimation multiply the weighted factor to obtain the side information. Then the dictionary is generated by the side information and KSVD algorithm.

January 2017

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Editor of the January Issue on
International Journal of Multimedia and Ubiquitous Engineering