Foreword and Editorial

We are very happy to publish this issue of an International Journal of Future Generation Communication and Networking by Science & Engineering Research Society.

This issue contains 29 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.

In the paper “Study on Remote Wireless Smart Pot System Based on ZIGBEE+MQTT”, the home internal wireless network smart pot system is established based on the combination of ZigBee and ESP8266. By uploading the plant growth data collected from the system to cloud server of Internet via MQTT protocol, users are allowed to remotely monitor the growing states of plants in the pots by operating mobile APP to water plants, change environment temperature, increase light intensity and kill weeds and insects. This is a scientific breeding solution with low power consumption, low costs and high efficiency.

Authors of the paper “Full Coverage Deployment in Wireless Sensor Network” can achieve the maximum efficiency and increase lifetime time of the sensors which result in the long battery life which is the back bone of any Wireless Sensor Network for Remote Sensing like in Oceanographic, Glacier study and Metrological Department for weather study which are nearly inaccessible regions.

The paper “Localization of WSN Using Fuzzy Inference System with Optimized Membership Function by Bat Algorithm” proposes a novel optimized input membership function by bat algorithm in fuzzy inference system using the data of received signal strength in real indoor condition. The author has realized the algorithm on Zigbee platform and the experimental comparison on other different centroid localization algorithms indicates that Mamdani fuzzy inference adopting the membership function optimized by bat algorithm renders smaller mean localization errors.

In the article “Network Isolation in Electrical Vehicle Charging Station”, network isolation system (NIS) can help electrical vehicle charging station (EVCS) to exchange messages with different systems (such as central monitor system, battery package and electrical vehicle (EV)) in a secure and efficient way. This paper focuses on the structure of EVCS, and then analyzes the boundaries of the trusted and the untrusted areas. On the top boundary, EVCS can communicate with the central monitor system. On bottom boundary, EVCS can communicate with EVs or battery packages. Based on this demarcation, this paper proposes the NIS architecture for EVCS. The new architecture can limit the top/bottom boundary of EVCS to enhance the securities. Finally, the proposed architecture is analyzed, which shows the feasibility.

In the study “False Alarm Method for Detecting Selfish Node in Manet”, several Techniques and requirements including intrusion detection system are used to detect the behavior of selfish node in MANET. The main requirement is that the system must be effective i.e. it must detect a substantial percentage of intrusions in the supervised
systems, while keeping the false alarm rate at an acceptable level. The existing system in the literature uses the watchdog method to detect the selfish nodes only to certain extent in the network. In order to detect the selfish nodes in the entire network the proposed system uses a false alarm method. In the false alarm method the reason for generation of alarm is found. The degree of selfishness is calculated to confirm the behavior of the selfish node. If the value of the selfish node is more than the threshold then the alarm is due to the nodes behavior else the alarm is due to the network disconnections. The network disconnections are detected using false alarm detection algorithm. The detection of the false alarm leads to better performance in the overall network.

In the paper “Research on Conflict Resolution and Consistency Maintenance Supporting Intention Combination in Real-time Collaboration Environment”, with the real-time group editing system, a group of users can view and edit the shared document by communication networks anytime and anywhere. Under the circumstance, it is surely inevitable that many operations from different users are going to conflict. Thus, two issues, the conflict resolution and the consistency maintenance, are the most important for designing and completing the system. In the past, the address space transformation algorithm, invented from the research about the real-time text editing system, could maintain consistency among more sites. The Multi Version conflict resolution approach could preserve users’ intentions but not all when conflicts occur. This paper proposes a new solution of conflict resolution, named Intention Combination Conflict Resolution strategy with the document model of AST based on the idea of Multi Version approach. This solution can not only preserve all users’ editing consistency by intention combination, but also keep all versions of operational objects including conflict operations’ combination effects. In addition, the effectiveness of related algorithms is analyzed, and the availability of the strategy is described by a case and proved by their experiment.

The author of the paper “Research on the Efficiency of Corporate Finance Governance under Network Environment: An Empirical Analysis Based on Data Envelope Analysis” analyzed financial governance efficiency of listed companies by using data envelopment analysis. In empirical analysis, they select input indicators from two aspects as financial governance structure and financial governance mechanism; financial governance mechanism includes decision-making mechanism, incentive mechanism and supervision mechanism.

Authors of the paper “Frequent Items Mining Algorithm Over High Speed Network Flows Based on Double Hash Method” propose a new algorithm based on double hash algorithm to realize large flow frequent items identification, according to the defect of MF algorithm which produces false positive easily and frequent updates to bring the huge pressure to the system. The complexity and false positive rate of the algorithm was analyzed. The effect of large flow frequent items statistical accuracy and discard rate for parameter configuration was analyzed through simulation. The theoretical analysis and the simulation result indicate that compare to MF algorithm, their algorithm can identify large flow frequent items more accurately, and satisfies the need of actual measurement.

The paper “On Latency-Efficient Transmission Scheduling for In-Network Data Aggregation in Duty-Cycled Wireless Sensor Networks” focuses on the data aggregation scheduling problem in duty-cycled WSNs (dc-WSNs), in which low-duty-cycle techniques are employed for energy-consuming operations. Based on greedy strategy, they propose two latency-efficient data aggregation scheduling algorithms, namely GAS-PAS and GAS-SAS for dc-WSNs. They theoretically derive the latency upper bounds of the proposed algorithms, and the results demonstrate that both GAS-PAS and GAS-SAS
achieve constant approximation to the optimal latency. They also conduct extensive simulations to show that the proposed scheduling algorithms can improve data aggregation latency in dc-WSNs under various network settings, comparing with state-of-the-art algorithms in the literature.

In the research paper “An Enhanced Perceptive Queuing Technique (CBCRTQ) for Traffic Management in VoIP Over MANET”, a new algorithm proposed which enhance the performance of traffic load in VOIP carryover MANET environment. Through a simulation and mathematical expression they analyze and evaluate QoS parameters, in the existing method there is no load balanced queuing mechanism and lack in cluster selection prototype. Hence researcher proposed a new Class Based Cluster Round Trip Queue (CBCRTQ) algorithm for VoIP (QoS) over MANET. The main objective of this algorithm selection of cluster heads form a virtual backbone and may be used to route packets for nodes in their cluster. There is a need of traffic load balance at Cluster Round Trip methodology in VoIP, Simulation experiment makes clear that the future algorithm does provide longer cluster head selection and duration with traffic load-balancing.

In the study “Convex Optimization Algorithms for Multiple Source Localization Based on Received Signal Strength Measurements”, decaying with the increasing of signal propagation distance, Received Signal Strength (RSS) is used in the wireless localization due to its low cost and easily implementation. When the transmit power is unavailable, two convex optimization algorithms including semi definite programming (SDP), second order cone and semi definite programming (SOC/SDP) are designed to estimate the source locations by relaxing the non-convex problem as convex optimization. The corresponding Cramér-Rao lower bound (CRLB) of the problem is derived. The simulations demonstrate that the SOC/SDP algorithm provides the similar accuracy performance compared with the SDP algorithm. However the computational complexity of SOC/SDP is lower than that of the SDP due to the less variables and equality constraints. When perfect knowledge of the path loss exponent is available, the simulations also show that the accuracy performance of the proposed convex optimization algorithms degrades as the path loss exponent increases.

In the study “Quantum Authentication Protocol of Classical Messages Based on Different Sets of Orthogonal Quantum States”, by using a pair of non-entangled qubits, a quantum authentication protocol of classical messages is proposed. In the pair of qubits, the first one is used to carry a bit message, and the second one is used as a tag to authenticate the classical message. In their protocol, a bit string instead of a sequence of maximally entangled states is used directly as an authentication key, so the authentication key can be easily stored offline. On the other hand, in their protocol, a unitary operation UA is chosen to encrypt the qubits so that the successful probability of all attacks analyzed is less than one. Their quantum authentication protocol is secure against various attacks such as the no-message attack and message attacks.

In the paper “Design of Grooved Microstrip Patch Resonator Filters for Mobile Communication”, the design of grooved microstrip patch resonator band-pass filter is presented at mid-band frequency 1.8 GHz for L-Band applications. It also acts as a band-reject filter at center frequency 1.1 GHz, which is innovative concept in microstrip filter design. Band-pass filter has a high attenuation in stop band, small insertion loss of 0.5744 dB and high return loss of 26.52 dB in the pass band whereas Band-reject filter has a low attenuation, high insertion loss of 21.95 dB and low return loss of 0.2432 dB in the stop band. The result is encouraging and fabrication is also very easy.
The paper “Detecting Moving Object via Projection of Forward-Backward Frame Difference” presents a rather fast visual object detection approach capable of approximating the location of moving object under heavy background noise or big overlap caused by negative similarity. Specifically, frame forward-backward difference concept is proposed to extract object features in current frame through fusion of pixel-based current-previous and current-following frame difference. Based on this, they formulate object localization applying the statistics of horizontal-vertical projection of the fused difference. Therefore, their object detection can be regarded as a direct thresholding process which guarantees high efficiency while holds good accuracy performance. They evaluate their method on Weizmann human action dataset and some traffic videos for both single and multiple objects detection which demonstrates its applicability and prospect.

In the study “An Intelligent PID Parameters’ Adjustment Algorithm for Control System”, the parameters’ adjustment of Control System is very complicated. Such as, the adjustment of voltage, temperature and liquid level, they have the characteristic of non-linear and mutation. The traditional PID control algorithm has the defect of overstrike and the low accuracy of adjustment, in order to improve the control performance of Control System, they proposed an improved intelligent PID algorithm for Control System parameters’ adjustment. First, they encode the three parameters of PID to a firefly position vector; then, find the optimal PID parameters by simulating the firefly population's food forage and mating behavior; last, adjusted the parameters of PID to intelligent control the Control System. They also using MATLAB toolbox to simulate the proposed algorithm, and give a group of contrast experiments about two control systems, the voltage adjustment and liquid level adjustment.

The paper “A Survey - Energy Efficient Routing Protocols in MANET” presents a survey on energy efficient routing protocols. These algorithms and methodologies modify routing protocol in order to reduce energy consumption and maximize life of network. These proposed methodologies also minimize energy consumption by selecting an energy efficient route.

In the paper “Research on Improved Fuzzy Optimization Routing Problem in WSNs Based on Genetic Ant Colony Algorithm”, the combination of traditional ant colony algorithm in solving the optimization process to consume a large amount of time, easily falling into local optimal solution and convergence is slow and other disadvantages, while also generating a lot of useless redundant iterative code, operation efficiency is low. Therefore, ant colony optimization algorithm is proposed. The algorithm based on genetic algorithm has the ability to search the global ant colony algorithm also has a parallel and positive feedback mechanisms. Changes in the use of genetic algorithm selection operator, crossover operator and mutation operator action to determine the distribution of pheromone on the path, the ant colony algorithm for feature selection using support vector machine classifiers for evaluating the performance characteristics of the feedback sub-Variorum And by changing the pheromone iteration, parameter selection and increase the local pheromone update feature nodes guided the re-combination. The algorithm uses probability expectation values are obtained to meet under the conditions with minimal sensor nodes, and gives the optimal coverage and connectivity probability models and reasoning.

In the paper “Design, Extension and Implementation of RADIUS Client”, RADIUS is an authentication, authorization and accounting protocol being widely used in network environments. Safe, efficient, and scalable RADIUS client module is an important part for a network access server (NAS) to provide access services. Through describing working mechanism of RADIUS, the architecture and interaction model to the external modules of
RADIUS client are given. Based on finite state machine (FSM) theory, states, events and actions of the protocol are analyzed, state transition mechanism is proposed, and then RADIUS client module is implemented. After that, the protocol is extended from aspects of secondary accounting, accounting update, users with no charge, forcing user offline, error status descriptions and so on. PPPoE test module in AX/4000 broadband test system is used for simulating access users to test functionality and performance of RADIUS client module on NAS, the test results show that NAS which realized the RADIUS client module can meet carrier-class functionality and performance requirements of access services.

The intention of the paper “Review On Channel Estimation For MIMO-OFDM System” is to review the work that has been already done in the field of channel estimation in MIMO-OFDM system. With the continuous growth and the improvement of communication system, their aim is to review the current best techniques available for channel estimation and provide a comparative analysis. In order to achieve this objective, a simulation has been performed for using various channel estimation techniques. The main emphasis is laid on selection of a channel through which the signals are to be transmitted. This paper reviews the different types of channel estimation in MIMO system by varying the precoding and modulation techniques.

The article “Design and Research of Remote Monitoring Terminal of Tomato Harvester Based on BDS and GPRS” designed remote monitoring terminal based on Bei Dou Navigation Satellite System (BDS) and General Packet Radio Service (GPRS), which formed remote monitoring system with communication system and monitoring center. The running states and position information of tomato harvesters were transmitted to the monitoring center by the monitoring terminal via the GPRS and Internet, and then stored and analyzed by monitoring center. The design ensured the monitoring center that could realize several functions, such as real-time display of position of tomato harvester and historical track of harvesting operation. In addition, the remote monitor terminal could provide technical supports of safety production and scientific control for tomato harvesting enterprises and would be significant to the informatization of tomato harvesting management.

Authors of the paper “An Efficient Multiple-Copy Routing in Intermittently Connected Mobile Networks” improve the performance of PRoPHET protocol by taking into account connection status to calculate nodes’ encountering probability. The performance of the proposed protocol was analyzed in terms of delivery probability, average delay, and overhead ratio.

Paper “Iterative Joint Detection and Channel Estimation Algorithm for Large-scale MIMO System”, proposed a novel iterative joint channel estimation and detection algorithm. First, the initial channel information is estimated with the uplink pilots. Then the receiver detects the receiving signals with Match Filter (MF) precoding and Minimum Mean Square Error (MMSE) criterion based on the initial channel estimation. The receiving signal acquires the great large-scale MIMO detection gains and is more lightly interfered than the multiplexed uplink pilots because of the non-coherence of the transmitted data. Thus, it is in turn applied to suppress the pilot contamination in the channel estimation. In the iteration, the updated channel estimation is used for the data detection in the next loop. The theoretical analysis shows that the interference items in the detected signals and the channel estimation are continually decreased with the number of the iteration increasing. At last, the numerical results prove that, the proposed algorithm has significant performance gains comparing with the conventional algorithms. After only one iteration in light pilot contamination cases and three iteration in severe pilot
contamination cases, it can obtain the detected data and the channel estimation information with the required performance. The proposed algorithm effectively improves the detection performance and suppress the pilot contamination of the uplink channel estimation, and can be worthy for the large-scale MIMO system.

In the paper “ADEC-Energy Proficient Four-Level Deterministic Hierarchical Clustering Protocol for Wireless Sensor Network”, as the popularity of Wireless sensor network is increasing and they are developed to perform a number of tasks, the issue of constrained energy of the sensor nodes is constantly raised by many researchers in past time. Many algorithms focus on the judicious use of the energy of sensor nodes to extend network lifetime for homogeneous as well as heterogeneous sensor networks. Clustering algorithms have been devised to optimize the energy consumption of a sensor network. In this paper they have extended the concept of heterogeneity in the deterministic energy efficient DEC protocol and proposed an advance deterministic energy proficient clustering technique for Wireless sensor network. They have implemented the DEC clustering algorithm in four level node hierarchies to enhance the sensor network life time, stability, and total remaining energy of the system.

In the study “Analysis of Signal Integrity for High Precision Digital-to-Analog Conversion Circuit”, in order to improve the accuracy of the digital to analog conversion (DAC), the reflection and crosstalk problems of the signal transmission process were studied in this paper. The Hyperlynx software was used for the simulation study of reflection and crosstalk problems of the master clock signal in the DAC circuit. Source end cascading termination resistor and remote end termination resistor and capacitor (RC) methods were adopted to weaken the reflected signal. The problem of signal crosstalk was solved by the remote end cascading termination resistor method. The experiments results showed that the reflection peak could be eliminated when the value of the source end cascading termination resistor was 100Ω. The reflection peak could be eliminated when the value of remote end termination resistors was 100Ω and the capacitance was 300pF. Terminating 100Ω resistor, shortening the length of the transmission line and decreasing the distance of the adjacent network could weaken crosstalk phenomenon. In high precision digital to analog conversion circuit, the source end cascading termination resistor and the remote RC termination were adopted to solve the problems of signal reflection. The methods of optimizing wiring and the cascading termination resistor weakened the signal crosstalk phenomenon. They also improved signal integrity and ADC accuracy of the signal during transmission.

In the article entitled “Turbo Product Codes Decoding Algorithm with Weighted HIHO for Energy-efficient Wireless Sensor Network”, complexity and energy-efficiency are viewed as two main factors of design error correct coding for the wireless sensor networks. First of all, this paper presents a Weighted Hard-Input Hard-Output (WHIHO) iterative decoding algorithm with the low complexity when the required bit error rate (BER) is satisfied for wireless sensor nodes. A reliability matrix from four different aspects of the decoding process, properly weighs and combines their respective reliability measures, and then employs the combined measure to make a judgment with regard to whether each received bit is correct or not. Next, the energy efficiencies of turbo product codes using HIHO and WHIHO decoding algorithm are analyzed.

Paper “Realization of 4G Downlink Channel” states that today’s era people have grown in every field, such that their needs are also growing linearly with their advancement. This rapid development of broadband wireless access technologies in recent years was the result of growing demand for mobile Internet and wireless multimedia applications. Now it is becoming difficult to meet the demands of these data hungry people. So, the wireless
network is advancing after 3G and providing better coverage, higher data rate and by reducing Latency. It uses the frame structure as Time Division Duplexing (TDD) and Frequency Division Duplexing (FDD). LTE technology uses different channels in both uplink and downlink. This paper mainly focuses on the Downlink channels named as PDCCH, PBCH, PCFICH, PHICH and downlink Signals i.e., PSS and S-SS. The individual Downlink Channels are analyzed using Agilent SystemVue platform further it is synchronized with the Agilent Vector Signal Analyzer (VSA) to the check the Output Response of the individual downlink channels.

“Research based on PSO-LSSVM Node Positioning in Wireless Network” proposed a node positioning of particle swarm optimization’s optimized LSSVM sensor in order to improve the positioning accuracy of wireless sensors, and aiming at the parameter optimization problem of least squares support vector machine (LSSVM). First, two-dimensional wireless sensor positioning model sample is established, and then LSSVM is adopted to establish node positioning model and PSO algorithm is used to find the optimal parameter. Finally, node’s performance of positioning is tested by simulation experiment. Compared with other positioning method, PSO-LSSVM improves the positioning accuracy of sensor node with some certain practical application value.

The paper “Research into a RFID Neural Network Localization Algorithm” proposed a particle swarm optimization algorithm based on particle swarm optimization algorithm and \( K-means \) algorithm. In this paper, firstly, the indoor positioning RFID model is constructed, and the positioning equation is constructed, then reduce the clustering algorithm to avoid human interference, through the \( K-means \) algorithm to form a particle swarm algorithm to initialize the particle swarm algorithm, finally, the particle swarm optimization algorithm is used to train all the parameters of RBF neural network, and then the optimal output model is obtained.
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