Foreword and Editorial

International Journal of Control and Automation

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

This issue contains 21 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 “A Novel Wireless Statistical Division Multiplexing Communication System and Performance Analysis” paper proposes a new wireless statistical division multiplexing (SDM) communication system, which is based on the two-input and two-output wireless communication experimental platform constructed and presented in the previous work. This novel system aims to transmit source signals simultaneously in the same frequency band over wireless channel and recovers the source signals at the receiver by utilizing the statistical characteristics of source signals and broadcasting characteristics of wireless channel.

In the paper “Clock Self-Synchronization Protocol based on Distributed Diffusion for Wireless Sensor Networks”, authors propose a clock self-synchronization protocol based on distributed diffusion (DDCSS). According to the energy, distribution and the average transmission delay of nodes, DDCSS chooses a set of master-node and diffusion-nodes which are used to perform local diffusion in each round. And then the average clock of master-node field is spread to the surrounding nodes. After that the surrounding nodes update the local clock by receiving the average clock.

Paper “A Noble Routing Protocol for Vehicular ad hoc Networks (VANETs) with Less Routing Overheads” presents advanced version of an existing MANET routing protocol for better performance in VANET environment. The new routing protocol has removed problem of large number of routing error messages which was existing in AODV routing protocol. Protocol proposed in this paper has better results as compared to AODV and paper has also shown results of simulation and also elaborated the findings.

The paper “Design and Implementation of Under-forest Economic Traceability System Based on Internet of Things” proposed a new method integrating RFID Barcode sensor technology to keep track of all stakes, in this process, in the traceability of storage, circulation, processing information, and the system can monitor circulation of environmental factors, such as temperature, humidity, and the paper analyzed the integrated approach of traceability system.

In the paper “Satellite Handover Techniques for LEO Networks Serving Air Traffic Control Communication”, the Handover procedure implication in the communication blocking
probability is estimated via simulation. To reduce the high number of Handovers, some strategies are used to cope with. Simulation models have been developed to improve all the features evaluated in this paper.

The paper “Framework Design of Emergency Management Information System for Cloud Computing in Chemical Park” says that the cloud computing and the expert system were used for the framework design of the emergency management information system to enhance emergency response capability of collaborative emergency management mechanisms. The use of middleware integrated with multi-source data achieved the unified data manipulation interface. The intelligent delivery of information system was provided. Using Agent-middleware technology to build decision layer could make massive data analysis, data mining and decision from the "cloud computing" platform access for every user. It can provide the necessary theoretical and technical support for enterprises in the chemical park to give full play to the collaborative emergency management capability.

The paper “Wireless Sensor Network in the Virtual MIMO Energy-saving Transmission Scheme” was based on the virtual MIMO STBC space-time coding technology combined with a cluster head cooperative transmission architecture, this paper proposes a suitable for clustering wireless sensor network based on STBC energy-saving transmission scheme of virtual MIMO space-time coding based on STBC based space-time coding in the MIMO system ber performance analysis, SCHCT scheme of the overall energy consumption model is established.

In the paper “A Review of Network Based Mobility Management Schemes, WSN Mobility in 6LoWPAN Domain and Open Challenges”, the authors’ focus is to study PMIPv6 based mobility management and different Scenarios based on it along with sensor’s mobility. Although existing research has made many improvements in terms of HO latency but less attention has paid towards signaling cost and packet loss, particularly in time critical areas. The study provides the complete survey of network based mobility management schemes, 6LoWPAN mobility and challenges associated with them.

The paper “Coverage Optimization Scheme Based on Artificial Fish Swarm Algorithm for Wireless Sensor Networks in Complicated Environment” proposed a strategy for wireless sensor network coverage optimization based on improved fish swarm algorithm. The improved algorithm is targeted on network coverage, node utilization rate and energy consumption balance, which makes use of the ergodic property of chaotic motion to overcome the disadvantage that artificial fish swarm algorithm may easily lead to regional optimization.

The Authors of “Performance Analysis of Statistical QoS Routing Schemes for Multihop Wireless Ad Hoc Networks” aimed to study and review the QoS routing schemes designed for IEEE 802.11 standard in Multihop Ad-hoc networks. Moreover, the paper simulates a routing scheme and shows results for an effective end-to-end communication.
In the paper “The Realization and Simulation of the Wireless Ad-hoc Network”, authors propose an efficient, stable self-organizing network protocol algorithm in the situation, to realize self organization and information communication. Using STM32 microcontroller as network nodes, it achieves a low power, high speed, high performance wireless ad hoc network, the node and terminal can form a stable network communication, quality of the network communication can be further improved. And compared with the AODV by using NS2, verified the feasibility of routing protocol in this paper.

The paper “Adaptive Distributed Gateway Discovery with Swarm Intelligence in Hybrid Wireless Networks” applies a biologically inspired metaphor to the Gateway Discovery problem in the networks, and presents a new approach-Adaptive Distributed gateway Discovery with Swarm Intelligence (ADDSI). Simulations have been conducted to demonstrate the performance of the proposed approach and to compare it with certain existing schemes in terms of packet delivery ratio, average end-to-end delay and normalized routing overhead.

In the paper “A Simple and Efficient Wireless Control Protocol for Small Scale Robotic Arm”, the design, implementation and experimental results of a simple and efficient wireless control protocol for small scale robotic arm is presented. The main objective of the research was to investigate RF transmission algorithms, design and implement, and obtain a small cost effective full remote control of a robotic arm without the use of a Personal Computer. The system is equipped with joysticks, two Arduino microcontrollers communicating via RF link, and a servo controller. Joysticks are used to fully control the motion of the robotic arm.

In the paper “An Improved Dv-Hop Localization Algorithm Based On Machine Learning For Wireless Sensor Network”, kernel PCR method is applied to collect and utilize the correlation between hop count and real distance, so as to build an optimal relationship model, converting hop count information between nodes into the value of real distance, so that DV-Hop method may be applicable to different environment. Compared with existing similar and typical methods, the method proposed in this paper has higher environment adaptability, as well as higher positioning accuracy and stability.

The Authors of “Scheduling in Interference-Limited Environment for LTE-A Systems” have proposed a method that would combine the Worst-case Fair Weighted-Fair Queuing (WF2Q) technique and Markov-chain to estimate the interference level prior to making final decision for allocation of resource units to UEs in order to enhance the network utility.

The paper “An Improved Indoor Localization of WiFiBased on Support Vector Machines” focuses on the development of a user localization uses existing WiFi environment for its low cost and ease of deployment. Authors propose an indoor localization of WiFi based on support vector machines (ILW-SVM), and use the bilinear median interpolation method (BMIM) to reduce the calibration effort on creating fingerprint map while still retaining the accuracy of user localization.
In the paper “Lower Modulation and Coding Scheme Provides better Performance with less SNR under Different SUI Channels in the WiMAX Communication System”, the performance evaluation of bit error rate in Wimax system under different combinations of digital modulation (BPSK, QPSK, 4-QAM and 16-QAM) and the Stanford University Interim (SUI) Channel model is selected for the wireless channel in the simulation. And the Wimax system incorporates Reed-Solomon (RS) encoder and Convolutional encoder with 1/2, 2/3 and 3/4 rated codes in FEC channel coding. It can be seen from the simulation results that the lower modulation and coding scheme provides better performance with less SNR in the Wimax communication system.

The paper “A Survey about Routing Protocols with Mobile Sink for Wireless Sensor Network” describes the main principles of the most representative routing strategies with sink mobility support, and highlights their advantages and disadvantages. Descriptions and comparisons of several typical routing protocols are given to deepen the understanding.

The experiment “Speech Coding” authors use two types of wavelets orthogonal and bi-orthogonal wavelets to transform the speech signal. Run length encoding algorithm is used to encode the threshold coefficient.

The paper “Genetic Algorithm-based Fuzzy Optimization Neural Network Model for WSNs Performance Evaluation” developed a model which is applied to evaluate WSNs performance of some samples, and the comparative analysis with other models shows that the model improves evaluation precision and efficiency and is practical.

Paper “LEACH Routing Protocol Based on Wireless Sensor Networks” work focused on the typical and successful representative in the introduction of hierarchical routing protocol to data fusion technology—LEACH protocol. And the performances of LEACH simulation algorithms were analyzed through MATLAB simulation.

October 2014

Wai-Chi Fang, National Chiao Tung University, Taiwan

Editor of the October Issue on
International Journal of Future Generation Communication and Networking