Foreword and Editorial

International Journal of Future Generation Communication and Networking

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 37 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 “Emergency Broadcasting over CATV Channel using FM Subcarrier Technology” states that emergency broadcasting is of importance method to alert people when disaster happens, but the development of network is slow in Chinese rural areas. So it is necessary to propose an emergency broadcasting solution for Chinese rural areas based on the available network. In this paper, a method that adopts FM subcarrier technology over CATV channel to broadcast emergency message have been proposed. In the method, emergency program is transmitted by CATV channel and emergency order is carried in FM subcarrier. As usual, to communicate emergency message to the public efficiently and effectively, a complete emergency broadcasting system should have following functions such as parallel broadcasting, compatibility, robustness, security, and so on. In the context, to satisfy above requirements, corresponding system construction, communication scheme, and message transmission protocol have been proposed as well. To verify the practicability, the solutions have been test in Chinese rural areas MiYun and gain good results.

In the paper “Mobility-Aware Node Clustering with Fuzzy Logic for Wireless Mesh Network”, in recent times, Wireless Mesh Network (WMN) has received prominence worldwide due to the evolution of wireless networks as a ubiquitous and seamless broadband service provider. Routing on WMNs is one of the most prominent research issues on these days. Hierarchical clustering based routing protocols are proposed by the researchers for large networks. In these protocols, all the available nodes are grouped into clusters. Each cluster consists of cluster members, cluster head and gateway nodes where cluster head plays the most vital role to form an efficient cluster. Selection of a better cluster head depends on the decisions made from different parameters and their relations. In this situation, fuzzy logic suits better by providing better analysis and helps to make the right decision based on different parameter values and their relations. In this paper, a fuzzy logic based hierarchical clustering technique is proposed for WMN. The proposed technique along with the existing Fuzzy Logic Control Clustering Algorithm(FLCCA) are experimented using the simulation software NS3 and the simulated results are compared to establish the efficiency of the proposed technique.

In the article “Formulations and Features of Person Selection in Organization Personnel Training Based on Supernetwork”, to investigate the reasonable method for selecting persons in organization personnel training, their study focuses on the formulation of personnel selection in organization personnel training based on knowledge supernetwork. First, this paper states the process of constructing organization training supernetwork and formulates the model for selecting single person. Subsequently, they establish the model for selecting multiple persons based on training knowledge supernetwork and analyze the
complexity and the shortcomings in detail. Third, to improve the accuracy of personnel selection, they build the model for selecting multiple persons based on step-by-step method and analyze the complexity. Final, the proposed models are verified by an application case.

Authors of the paper “A Power and Performance Management Simulation Platform for Web Application Server Cluster” propose a CloudSim-based simulation platform in this paper. It can simulate different cluster deployment algorithm, request scheduling algorithm and load feature, where cluster’s deployment includes the on/off state, CPU frequency and request scheduling parameter(s) of each server. By the aid of HookTimer component, the platform supports periodical and conditional deployment trigger modes, and can calculate some common performance indicators. The usage of interface, dynamic proxy technique and XML configuration file make the platform have good extensibility and configurability. In addition, a request-number-triggered management strategy is proposed and simulated by the platform.

In the paper “Performance Analysis of routing protocol for improvement Quality of Service (QoS) in Wireless Sensor Network”, Wireless Sensor Network has many sensor nodes that are used to monitor the physical and environmental condition such as Vibration, Temperature Sound and so on. In Wireless sensor network all sensor cooperatively pass their data to the base station from where data are transmitted via satellite or internet to the base station. Wireless sensor network has some constraints like power or energy is limited, computational capability is limited, storage capability is limited. Energy efficiency of sensor nodes is very big issue in wireless sensor network because sensor nodes have low energy. To improve energy-efficiency of sensor nodes various routing protocols have been proposed in wireless sensor network like Cluster based routing protocols-LEACH (Low-Energy Adaptive Clustering Hierarchy), LEACH-C (Low-Energy Adaptive Clustering Hierarchy-Centralized), EEPSC (Energy-Efficient Protocol with Static Clustering), Cross-layered modification technique and other routing protocols like AODV, DSR, Bellman Ford, DSDV and DYMO Routing protocols. So in this work they try to analyze the performance of AODV, DYMO and DSR routing protocol for improvement Quality of Service (QoS) in Wireless Sensor Network. The parameters used for the performance analysis include average jitter, throughput, average end to end delay.

In the paper “Acoustic Model Fusion Method of British and American Compatible Mode”, the British and American English are the most common target accents. British and American English have different phonetic symbol and pronunciation system. These two accents have many learners. And some learners have mixed phenomenon of British and American accent. Based on the mixed phenomenon British and American English accent for English learners, this paper put forwarder a model of American and British accent fusion method, improve the quality of the pronunciation evaluation performance system, and realize the embedded compressed acoustic model. This method divides acoustic model into alternative model, fusion model and encourage model by replace probability. The alternative model could be removed, and isolated model could be reserved. The fusion model could be merged based on model interpolation and model clip. Pronunciation quality evaluation results showed that the correlation of speaker level increased by 14.1%, compared with single accent model and in fusion model, fusion model was similar to the performance of the hybrid model, the figure of gaussian component compressed by 10.7%.

The paper “Performance Analysis of IEEE 802.15.4/Zigbee Networks Under Route Information Based AODV Routing Algorithm” states that in the field of wireless communication, zigbee is a latest technology in wireless network based on IEEE 802.15.4
standard. On IEEE 802.15.4 standard based zigbee network uses low power sensor nodes to ensure reliable, process, collect, and store the data. The sensor nodes have low cost, smaller in memory size and used in lower coverage area first two layers based on IEEE 802.15.4 standard are PHY and MAC layer. Routing protocols are divided in two categories that are reactive protocol and proactive protocol. AODV routing protocol comes under reactive protocol. It creates route between source and destination when needed. When source node has data to transmit to the destination node then it will create RREQ (route request message) and send to all neighbors in the network, when the destination node found or neighbor node found the route to destination then they will generate a RREP (route reply message) and forward back to source node. After the creation of route between source node and destination node they can exchange the data.

In the study “Three-phase Cooperative Jamming Based Improving PHY Security for Multicast Network with an Untrusted Relay”, a multicast network in the presence of an untrusted relay is investigated. A three-phase AF-based cooperative jamming with power allocation is proposed to enhance the system secrecy rate. Based on time division based cooperative multicast (TDCM) protocol, the source uses part of its available power to broadcast pre-defined jamming signals in order to create interference at the untrusted relay, while the relay amplifies the linearly combined two received signals and then re-transmits it to the destination. Optimum power allocation policy involving the allocation between the information and jamming signals at the source and between two combined signal factors at the relay to maximize the achievable worse secrecy rate or sum-rate are derived and analyzed.

Authors of the paper “The Design of S-box Based on Cascaded Integer Chaos Applied to Wireless Sensor Network” states that in the block cryptogram algorithm of wireless sensor network, the emphasis is how to design a secure and efficient S-box. A design method of S-box is proposed based on dynamic iteration of the cascaded integer chaos, which is obtained by the cascade and integer quantization of one-dimensional discrete chaotic map logistic and tent. the S-box not only conform to the application requirements of node operation and computational efficiency, but also compensate the degradation of dynamic characteristics of the single-level integer chaos. The performance tests of S-box were carried out, including nonlinearity degree, differential uniformity, strict avalanche criterion, out-put bit independence criterion and bijective property. In contrast to the existing classical S-box based on chaotic map, the results indicate that the S-box has more excellent cryptographic properties, and it can be used as a candidate nonlinear component in the design of block cryptogram algorithm for wireless sensor network.

In the paper “OFDM-System Design Using Adaptive Modulation and Channel Estimation for Underwater Acoustic Communication”, underwater Acoustic (UWA) channels are known as some of the most challenging communication media. Since the Underwater acoustic channels are time varying multipath channel achieving the high data rate, a low latency and a high throughput which often is a very difficult objective. In this work, they designed an OFDM transceiver system which is suitable for underwater acoustic communication with limited bandwidth to enhance the data rate at the receiver. To enhance the data rate at the OFDM receiver they have used efficient adaptive modulation scheme, channel estimation and channel equalization schemes for UWA communication. they have focused on the efficient modulation schemes like QPSK, DPSK and 16-QAM which is best suited for adaptive techniques based on the SNR of the Rayleigh fading channel to enhance the data rate.

The paper “A Clustering Algorithm Based on Zone in Vehicular Ad Hoc Networks” states that Vehicular Ad Hoc Networks (VANET) is a wireless mobile ad hoc networks
established on the inter-vehicle communication. Due to the special characteristics and the restrictions of roads, VANET shows characteristics of uneven nodes density, fast moving, high dynamic topology. So it is difficult to establish a stable link between nodes, and the reliability of data transmission declines rapidly with the increase of hops. Therefore, ensuring data reliability and rapid distribution is always a difficult point in the VANET research. Through analysis of vehicular ad hoc networks environment, they propose the node connectivity and the connectivity strength. By dividing the road environment into the segment area and the intersection area, respectively calculating and predicting the connectivity according to the road environment, they propose the zone based adaptive clustering algorithm (ZACA).

In the paper “Network Traffic Identification Algorithm Based on Neural Network”, a network traffic identification model is established using a multilayer excitation function quantum neural network which is suitable for data classification. Because the conventional quantum neural network has different target function in the training of the weights of the network and the sigmoid function of the neurons in the hidden layer, the coupling effect of the two parameters is not processed. This will result in the middle and later stage of the training iteration process, and it may be possible to reduce the objective function value of a kind of parameter, and make the objective function value of another kind of parameter increase. In order to avoid this situation, using LM algorithm to optimize, using the same objective function not only as the target function of the network weight, but also the function of translational spacing of sigmoid function of neurons in the hidden layer, and the training objective is to minimize the sum of squared error of the neural network output and the desired value. Finally, the recognition performance of the proposed algorithm is compared with that of the conventional quantum neural network and LM-BP neural network. The results show that the convergence rate of the proposed algorithm is the fastest and the convergence accuracy is the highest.

In the paper “SDN-based Handover in Future WLAN”, presently, the smart devices consumers prefer IEEE 802.11-based wireless local area network (WLAN) to access the Internet due to ease of access, low cost, tremendous throughput, and provision for multimedia applications. However, traditional WLAN suffers from a critical issue regarding handover management because it has not been well-announced in IEEE 802.11 according to future Internet demands. Researchers argue that Software Defined Network (SDN) be future Internet technology revolution that brings significant impact on a wireless network. In this paper, they propose a framework within the SDN paradigm, which enables mobility management, load balancing, and position management applications on top of the centralized controller. The proposed framework implements load targeted handover (LTH) scheme for mobile stations to offers seamless handover and targeted association with underloaded APs. they evaluate LTH approach in a simulation environment then implement in real-time WLAN tested, and results demonstrate that SDN-enabled handover process leads to consistent throughput as compared to a traditional approach.

The study “P2P Traffic Detection Based on Particle Swarm Optimization Algorithm” states that considering the shortcomings of the conventional BP neural network, such as slow learning speed, weak anti-interference ability and easy to fall into local minimum, the detection accuracy of P2P traffic detection model is low and the speed is slow, the particle swarm optimization algorithm is used to optimize it here. As the conventional algorithm's optimization ability is the initial parameters, the algorithm is easy to be early, and the convergence speed is slow. Therefore, grouping, organizing, fission and mutation operation on the conventional algorithm have been carried on in order to improve the defect of conventional algorithm. Finally, the P2P traffic detection model is built by using
MATLAB software, and traffic detection experiments are carried out on BitTorrent, EMule, PPlive and PPStream 4 P2P network applications. The test data show that the average recognition rate of the recognition model is 96.14%, which is 13.3% higher than that of the conventional PSO-BP model, and 9.4% higher than that of the QPSO-BP recognition model for the four P2P network applications.

In the study “Simulative Analysis of Hybrid Dispersion Compensation Based on 16x40 Gbps DWDM System Using RZ Modulator”, 16x40 Gbps hybrid dispersion compensation schemes with RZ modulation format over SSMF link based on DWDM optical system. Power losses substitute by the EDFA and DCF. Error probability is minimizing the system and optimizing the system performance for all users and channel using in system. The average total output power of the system is -53.65 dBm and the maximum Q-factor is 5.87 and range of BER is <10^-12. The simulation results show that data transmission rate successfully transmitted with low cost effective infrastructure with good system performance.

In the paper “Application and Research of Active RFID-Based Positioning System in Sport Competition”, it has made a deep research to the application of RFID positioning in sports competitions. It also researched the application of VIRE algorithm in positioning system, and proposed an improved VIRE algorithm, also chose the appropriate interpolation method. Through the improved location algorithm, it builds a relationship between the distance and time in finish line of the athlete, and solves the function to make sure the time that athletes reach the finish line, so that it can achieve the purpose of timing.

Paper “A Node Importance Measuring Method based on Hypernetwork” states that measuring the importance of nodes in network is an important issue in the study of complex networks. The networks in current researches are mostly based on classical graph theory, which have limitations on describing certain complex relations. In this work, they introduce hypernetwork, taking hypergraph as representation foundation, to describe relations. Hypernetwork is able to extend the modeling and describing capability of traditional network and may be a promising representation model of complex relations. However, a general lack of attention to the node importance measuring in hypernetwork, an important fundamental issue for its further application, has been noted across the majority of related published works. In this paper, they utilize the idea of deleting method, to measure the importance of node in hypernetwork through investigating the influence on the whole network when deleting it. Specifically, the influence is measured by direct loss and indirect loss. Through a calculating example, their method is compared with node degree, betweenness, closeness centrality, degree of neighbor nodes etc., the result shows this method has better adaptability and accuracy.

Author of the paper “Secure Mobile Commerce in Ad hoc Network Using CAEC2M” states that M-Commerce applications in the world have grown exponentially over the years. It had set up for mobile users to engage wirelessly of ad hoc network infrastructure in online business irrespective of place or time. Providing anonymous, secure and trust based connection service in ad hoc network is quite a challenging task. Anonymity, security and privacy of the transaction or message transmission are the highest priority need to be delivered to the destination node on time. In this paper, a CAEC2M (Cellular Automata Elliptic Curve Cryptography Mix network) algorithm to secure Mobile Commerce over ad hoc network is proposed. An attempt is made to design a mix-network (Mix-Net) using elliptic curve cryptography based on cellular automata which creates a hard to trace communication to protect the anonymity of the sender and encrypt the sensitive information to avoid any eavesdropper trying to access the data during
transmission. CAEC2M provides also confidentiality, integrity and authentication.

In the paper “Method for Network Traffic Generation Based on User Behavior of Streaming Media”, existing traffic generation methods generate traffic by the flow generator structured and then sent data packets, which had two problems, one is that the traffic generated is not enough authenticity, the other one is that the rate of flow is not high. For coping with the method for network traffic generation based on user behavior of streaming media and streaming media server was presented. The test results show that comparing with D-ITG, the size of traffic produced by this method has been obviously improved, and its principle indicates that the flow is highly authentic. The proposed method breaks through the traditional thinking of traffic generator sends packet by itself, which decreases the difficulty of the realization of the traffic generator and has good reference value for the researches and development of traffic generator.

Authors of the paper “Cooperative Spectrum Sensing Optimization Algorithm Based on Adaptive Threshold Setting” states that energy detection performance in the signal to noise ratio (SNR) fluctuation needs to be improved. In order to obtain the highest probability of detection, a new cooperative spectrum sensing algorithm is proposed. Dynamic double energy thresholds and adaptive grid search are utilized to obtain the highest probability detection. Double thresholds are adaptive to noise fluctuation, and in order to obtain the best sensing performance, adaptive grid search is used firstly to find the optimal double thresholds. Simulation results show that the proposed algorithm has excellent robustness to noise fluctuation and good sensing performance even under the low signal to noise ratio.

Authors of the paper “MANET Parameter Analysis and its Impact on Next Generation Network” states that a mobile ad-hoc network is a type of network in which all the nodes can communicate each other without any fixed infrastructure. This unique property of MANET is useful in conditions where exchange of information is the prime objective under any circumstances. In this type of network all communicating nodes cooperate with each other in the distributed manner and offer dual responsibility, one as a host and the other as router. This quality of MANET paves the way for numerous new and exciting applications over Next Generation MANET. These applications may include, such as group communication, data telemetry, automotive applications, music and video streaming, real time mobile applications. Two main evolutions of multihop next generation ad hoc networks are projected, namely WMN and Opportunistic Networks. In this paper an honest attempt is made to enumerate and briefly discuss issues and challenges of Next Generation Network, parameters analysis and its impact.

In the paper “The Scheme of Power Allocation for Decode-and-Forward Relay Channel in Energy Harvesting WSNs”, recently, the issue of excessive energy consumption in wireless communications has become increasing critical, and the energy harvesting as a renewable energy resource, has received extensive attractions. In this paper, a wireless sensor network (WSN) is considered, where the source-destination pair communicates via an energy harvesting relay links. they study the problem of the harvested energy distribution among the source, relay and destination nodes. An effective power allocation scheme is developed which exploits the decode-and-forward (DF) relaying strategy and channel state information. The outage probability is analyzed and simulation results show that the outage performance for two sub-channels is always performs well in the cases of different threshold target data rate. Moreover, the effect of the different ratio of the optimal sub-channel gain and Rayleigh channel gain on the outage performance is evaluated.
In the study “Innovation and Development Strategy of Logistics Service based on Internet of Things and RFID Automatic Technology”, internet of things is a major change in the development of science and technology; it combines the virtual information with the physical world, so that economic activity and social activities are more intelligent, convenient and efficient. In this paper, the author research on the innovation and development strategy of logistics service under the internet of things. The essence of modern logistics is to take the information technology as the core competitiveness, pay attention to the integration of resources and the whole process of logistics optimization, it is the ablest to play the advantages of Internet of things technology applications. The application of communication and network technology in real-time transfer of information, it can realize the logistics operation agility and integration.

The paper “Design and Implementation of Router for NOC on FPGA” states that in today’s technological era, SOC has undergone rapid evolution and is still processing at a swift pace. But due to this explosive evolution of semiconductor industry, the devices are scaling down at a rapid rate and hence, SOC today have become communication-centric. However, the existing bus architectures comprising of wires for global interconnection in SOC design are undergoing design crises as they are not able to keep up with the rate of scaling down of devices. To overcome bottleneck of communication system, NOC is an upcoming archetype. In on-chip network, router is considered as an important component. This paper proposes router, its components and parameters which affects the entire design. Thus, to validate the functioning of NOC on hardware, router has been designed in VHDL and simulated in Xilinx ISE 14.1 targeting Xilinx XC5VLX30 FPGA.

In the article entitled “An Improved Energy Balance Routing Protocol based on LEACH Protocol”, LEACH algorithm is a classical hierarchical routing algorithm; it uses the cluster head rotation mechanism to allocate the energy consumption to the whole network. But because of the randomness of the cluster head selection, the optimal number of cluster heads cannot be obtained, at the same time, its position cannot do the best, some regions of the cluster head may be more concentrated, some areas may not cluster head, lead to the distance of non-cluster head node and cluster head node is too large, the energy consumption is too large. So an improved routing algorithm based on LEACH algorithm is proposed, the basic idea is to determine the optimal number of cluster heads, non-uniform clustering, at the same time, the threshold is added in the LEACH algorithm, the nodes with high residual energy become cluster heads, in the process of transmission, multi hop transmission mechanism is adopted among cluster heads. Simulation results show that, this algorithm further reduces the energy consumption in the network, effectively extending the life cycle of the network.

The paper “A Research of Sensors Complementary for the RFID Wireless Network Based on the Variable Coverage Radius” states that in order to solve the problems of sensors complementary, algorithm sensors complementary for the RFID wireless network is proposed in this paper. Based upon the fundamental definitions about the probabilistic events and the data generated by the particle filtering algorithm, the paper considers the factors of the number of locations covered and the probability the object appears. In view of the definition of the covering variability and the cover ratio, 5kinds of RFID sensors covering radius are considered. Finally, the experiment is carried out in order to improve the algorithm’s availability and effectiveness.

Authors of the paper “A Survey of Black Hole Detection Policies in Mobile Ad Hoc Networks” states that a mobile ad hoc network (MANET) is defined as a network that has many free nodes that are composed of mobile devices that can arrange themselves in various ways. The important aspect of the MANET is security. In MANET the nodes are
connected with the help of its dynamic topology and leave network at arbitrary locations. Ad-hoc On-Demand Distance Vector (AODV) protocol provides dynamic routing between mobile nodes that wish to establish and maintain an ad hoc network. The working of AODV protocol is affected by a particular type of attack called black hole attack.

In the paper “An Interference Suppression Method in Wireless Network of C-RAN Architecture”, the channel sharing in wireless networks leads to user mutual interference, which also exists in the centralized, cooperative, cloud, and clean-radio access network (C-RAN) which is considered as the access architecture of the 5G mobile communication system. In this paper, the problem of uplink interference suppression in the architecture of C-RAN wireless network was investigated. Taking advantage of the centralized processing in the C-RAN architecture, the correlations of the signals from each RRU are analyzed, based on which they proved that under certain condition, interference can be eliminated by utilizing the correlations among signals. According to the theory before, interference matrix between network users was established based on signals from each user to its nearby RRU. Then, the interference cancellation matrix can be gotten. The uplink signals in the network were processed by making use of the interference cancellation matrix, which can turn the interference part caused by the transmit signal of mobile terminal into useful signal.

The paper “A Queueing Model for Node-disjoint Multipath Routing in Cluster-based Hierarchical Multimedia Sensor Networks” states that node-disjoint multiple routing is an effective mechanism for delivering rich multimedia in wireless multimedia sensor networks. And congestion is one of main problem must be addressed in routing scheme. Considering routing paths established are of non-interference and node-disjoint, each routing path can be viewed as a node. And then a queueing network model is introduced to abstract multiple type multimedia packets delivery process through node-disjoint routing paths in cluster based wireless multimedia sensor networks. At cluster header, QoS-aware traffic schedule scheme is adopted to dispatch packets of different priorities. The scheme consists of receiving buffer queue, traffic packets dispatching service based on generalized Erlang distribution, and priority-based sending buffer queue. Then they model the optimal decision control process of multipath routing in congestion state. Finally, they simulate the proposed queueing network model with trust-based load balancing scheme. And the results reveal that their proposed model is more suitable for node-disjoint multiple paths to deliver rich multimedia information, such as video and images.

In the paper “Developmental Approaches Covering Context Area Mobile Applications Service Oriented Architecture and Model Driven Architecture”, model Driven Architecture (MDA), as they consider the growing significance and utility of modeling in the development of software and solutions, it reflects the benefits of MDA to transform one PIM into several PSMs, each for platform or technology in which the final system will be deployed, and the automatic code generation that implements the system for those platforms from the corresponding PSMs. Service-oriented architectures (SOA) are also presented as the key to business agility, especially when combined with a model-driven approach. Model-Driven Architecture (MDA) is a well-developed idea that fits well with SOA, but as of today, it has been a specialized technique that is beyond practical application scope of most enterprises. they describe the MDA and SOA abstract components to be useful in mobile business applications in the future, allowing to add the features of the two modeling architectures, concentrating on the classification of models that is embodied individually. The framework given, a unified modeling architecture, which illustrates how the two architectures can be brought together into one.
The paper “Improvement Research on S-MAC Protocol in Wireless Sensor Network”, paper strengthens the application of adaptive listening technology in S-MAC. When the nodes have no data to process, they are in dormancy state for most of the time, while when the data is coming, they become active quickly and participate in data transmission actively. The nodes which can feel the transmission is just around will participate in adaptive transmission as much as possible and make continuous adaptive listening within one dormancy period. In this way, realize the purpose of deceasing end to end delay greatly on the basis of not increasing additional energy consumption. For applications which are sensitive to system response time, the improved S-MAC is with greater application value.

In the paper “Research on Data Transmission Security Technology of Wireless Sensor Networks”, regarding to the online data compression issue of wireless sensor networks, a disconnected segmented linear compression algorithm GDPLA is proposed. The algorithm uses the least number of disconnected segments to approximate describing the original time series under the condition of the error limit be guaranteed. The algorithm GDPLA is an optimal algorithm from the number of segments generated. In addition, the GDPLA algorithm requires linear run-time only, and the linear coefficient is 6, which makes it suitable for resource-constrained wireless sensor networks. Finally, the experiments on two real data sets show that the compression rate of their algorithm is obviously superior to other algorithms.

The article “Study and Design of SDN Intelligent Campus Architecture Based on IPv6”, paper makes Internet of things cover the entire campus through wired and wireless accesses. As a result, campus sees the fulfillment of information transfer via computers, mobile phones, devices and other articles, which is the embodiment of intelligence. Besides, OPNET is used for modeling and simulation of wireless network structure in SDN intelligent campus, with a view to analyzing the feasibility and advantages of various campus network topologies. Then, a reasonable scheme is presented responding to different types of topologies, which is conducive to better building an intelligent campus.

The paper “NOP: An Efficient Non-optimization-based Method for RFID Network Topology Design” states that for Radio Frequency IDentification (RFID) applications in Internet of Things, proper reader deployment is important because unguarded deployment may cause reader-to-tag or reader-to-reader interferences, incurring huge deployment cost. Current RFID topology designs are optimization-based whose heuristic search for optimal or sub-optimal solutions may take much complexity and whose improper utilization or concurrent consideration on the involved objectives may generate unfavorable results. To pursue more desirable reader deployment for RFID networks, this paper presents an efficient new topology design – NOP. NOP involves a Non-OPTimization practice to avoid the tediously long heuristic search in optimization-based methods and gives proper sequential considerations on involved objectives to avoid improper objective utilization. The conducted experimental evaluation shows that their NOP method can produce better reader deployment by reduced complexity. Specifically, it outperforms optimization-based methods, such as GA, GAA and IGAA, by yielding higher fitness values at less processing time and deployment cost.

The article entitled “Critical Algorithm for Graph and Image Compression and Transmission Research” is dedicated to the purpose of introducing the simplification of the triangular-network's multi-resolution, as well as the concept of grid, trigonometry, topographic goading, triangular-sector, etc. In addition, this article proposes a new algorithm that combines the layer-segmentation of the multi-resolution model and the
binary space partitioning (BSP) tree, in which the layer-segmentation of the triangular belt is capable of achieving a better result in terms of dissolving the model, therefore creating the foundation of the BSP tree's structural setup. The purpose of finding BSP tree, on the other hand, is to identify sensitive data from the non-sensitive one, so that whatever data that is contacted with the viewpoint can be fully transferred and displayed. Speaking of the designing part of the database, this algorithm combines the latest techniques such as the XML.ADO.NET, and thereby capable of designing transfer plans accordingly.

The paper “RF Transceiver Circuit FPGA Program Design and Development” states that as the communication technology is developing rapidly and the communication system and standard are updated constantly, people proposed the concept that the virtual radio is realized through software to achieve the interconnection among equipment. The paper shows the basic structure and module composition of virtual radio RF front-end, highlighting the key technology for hardware design of the whole RF front-end as well as the FPGA local control logic. The hardware, consisting of FPGA module and its control module, is provided with the relative design of circuit diagram. Moreover, the tests on RF front-end board are presented in the paper, proving that the board has favorable commonality to serve as the RF front-end for receiving and sending of wireless signals in software radio system, being used as wireless access card device and wireless system experiment device, and for building the industrial private communication system.

Authors of the paper “Architecture of LTE-WIFI Integration for SDN Towards IP Systems” states that against the background of a surge in software-defined network (SDN) as well as urgent demands for LTE-WIFI internetworking and IPv6 network integration, the paper integrates LTE mobile telecommunication technology, wireless local area network and 5G (the fifth generation mobile communication system) into one, in an attempt to complete routing, distribution, and transmission of different radio frequency signals (i.e. LTE, WIFI) on the SDN basis. As a result, large-area coverage of LTE-WIFI network signals is realized in a way that meeting the demands of reliability, safety, flexibility and extendibility for mobile internet. What is more, different complementary wireless telecommunication systems are closed combined with each other. Through the use of SDN integration technology, the paper designs network integration architecture of IP-LTE mobile internet and WIFI, and also studies on the application of SDN-based IP optical integration network, which has broad prospects.

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Wai Chi Fang, National Chiao Tung University, Taiwan

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