Foreword and Editorial

International Journal of Future Generation Communication and Networking

We are very happy to publish this issue of International Journal of Future Generation Communication and Networking by SERSC Australia.

This issue contains 10 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 “Design & Analysis of Noise-Resilient Mix Data Rate Passive Optical Network Supporting Simultaneous Transmission of Both NGPON Standards” have designed and investigated high data rate supported Wavelength Division Multiplexing Passive Optical Network (WDM-PON) architecture having 16 channels. In this proposed technique, Differential Quadrature Phase Shift Keying (DQPSK) modulated signal having 40 and 10 Gbps in downstream and Inverse Return-to-zero (IRZ) modulated upstream is used with 20, 10 and 2.5 Gbps data rate. Transmission performance of proposed system has been compared on the basis of Bit error rate (BER) analysis at 10 Km fiber length in both directions. Simulation results validate that proposed technique can simultaneously support high data rates for both next generation passive optical networks (NGPON) standards with good receiver sensitivity and noise-resilient transmission of all 16 high capacity WDM channels.

In the study “Optimal & Computationally Efficient Resilient Technique (OCERT) for Optical WDM Networks”, the survivability of Wavelength Division Multiplexing (WDM) networks is a very critical issue and there has been great research interest in the area of survivable WDM network design. Also, network service recovery from multiple correlated failures is a major concern given the increased level of infrastructure vulnerability to natural disasters, massive power failure and malicious attacks. Thus, this research paper has been framed considering protection and restoration mechanisms in order to guarantee the survivability of the networks. In this paper, for based optical networks, link and node failures recovery using p-cycles have been accounted for. The proposed optimal & computationally efficient resilient technique takes care both node and link failure recovery relied upon a set of suitable candidate p-cycles for reducing the existing high computation time problem. The capacity efficiency and protection or restoration capabilities of proposed scheme are evaluated through numerical results. Extensive simulation results obtained indicate that the proposed scheme outperforms the traditional approaches in terms of performance metrics such as blocking probability, resource utilization efficiency and computational time.

Paper “WI-FI Based Indoor Positioning Using Fingerprinting Methods (KNN Algorithm) in Real Environment” states that Global positioning systems have difficulties in finding positions inside buildings. Hence other techniques and methods are required for indoor localization. Since indoor positioning needs additional indoor infrastructures deployment, convenient techniques using Wi-Fi can be developed. In this research, indoor positioning using Wi-Fi access point is investigated as the main usage of Location Based Service (LBS) applications. They employed fingerprinting methods to increase the accuracy of positioning. The study had been done in real environment in Universiti Teknologi Malaysia (UTM). The models were designed using KNN algorithm for indoor
positioning. The fingerprinting dataset contained received signal strength from different numbers of existing Wi-Fi access points in the real environment. Additional features were applied to the model in order to enhance the accuracy. The accuracy rate and mean square error were calculated. Evaluations of models had been done by conducting experiments to compare each model with different features. Analysis suggests that KNN method which achieved 77% of accuracy with K=7 is the most precise model for indoor positioning in this study. By applying signal strength from additional access points, more precise results had been achieved and distance errors had been eliminated.

In the paper entitled “Study of Black Hole Attack in AODV”, the Mobile Ad-hoc Networks (MANETS) are decentralized, multi-hop networks where the intermediate nodes act like routers to pass data packets to destination. The Routing protocols are playing very vital role in effectiveness of MANETS due to mobility and dynamically changing of topology. Now many routing protocols are susceptible to attacks because of the nature of broadcast wireless medium and not have central control. Ad hoc On-Demand Distance Vector routing (AODV) is a very trendy routing protocol and it is very susceptible to black hole attacks. In black hole attack a mobile node mistakenly publicize the route and sinks data packets to incorrect destination instead of sending to accurate destination. Hence the paper is in context of black hole attacks in AODV. It analyzes the related work and position a solution based on analysis.

Paper “A Wide Axial Ratio Bandwidth Circularly Polarized Antenna for Spectrum Occupancy Measurement Campaign” states that the spectrum measurement campaigns conducted worldwide have confirmed by showing that the considerable amount of radio spectrum is underutilized. In the literature, it is observed that most of the spectrum measurement campaign utilizes commercially available antennas. In this communication, a novel circularly polarized wide axial ratio bandwidth circularly polarized microstrip antenna is designed for Spectrum Occupancy Measurement. The antenna exhibits, wide -10 dB impedance bandwidth from 700 MHz to 2.9 GHz and wide -3dB axial ratio bandwidth from 1.5 GHz to 2.7 GHz. The prototype of the antenna is fabricated, and the simulated results show very good agreement with measured results. Thereafter, the spectrum sensing ability of the antenna is verified through the spectrum sensing measurement setup show excellent spectrum sensing ability, -24 to -31.5 dBm in GSM 900 MHz, LTE 2.1 GHz, and ISM 2.4 GHz bands in the outdoor surrounding. The proposed antenna is compact and easily portable and easy to integrate with the spectrum sensing measurement setup.

The article “Position Based Density Conscious Routing Protocol in Vehicular Ad Hoc Networks” states that Vehicular ad hoc networks (VANETs) have high mobility of vehicles resulting in frequent disconnections in routes. Geographic routing protocols are commonly preferred in VANETs as they do not require, route formation prior to forward the data packets as well as route maintenance. Most of the position based routing protocols adopt the greedy mode to establish the route and switch to some recovery mechanism like perimeter routing, in case of failure. Due to high mobility characteristic, selection of next forwarder based on greedy approach basically affects the performance of the routing protocols. At the same time neighborhood density of a vehicle play significant role for the selection of next forwarder toward to the direction of destination. In this paper, they propose a routing strategy that uses the restricted greedy forwarding to select next best fit forwarder, which will reduce the frequency of switching to recovery mode. Vehicle seeking the next forwarder will consider neighborhood vehicles having a sufficiently dense neighborhood and the vehicle out of these considered set having the least standard deviation of average relative velocity with its own neighboring vehicles will be selected as the next forwarder. The objective is to increase the longevity of the
route and thus increasing the throughput without greatly affecting the end to end delay. The performance of the proposed approach is compared with E-GyTAR and GPSR, and the simulation results are presented for both highways as well as city scenarios.

In the paper “Analyzing the Increase of Network Life Time for Wireless Sensor Network with Smart Local Moving Algorithm using NS2 Simulator”, energy economical routing could be a one in the entire key trusty space in Wireless sensing element Networks. The wireless sensing element network comprising of an oversized variety of sensing element nodes that has restricted energy store. The sensing element nodes area unit working with the help of the sources likes the battery. The saving of very useful resource like energy becomes supplementary a very significant subject in WSNs. The routing algorithms guarantee the conception of energy saving while not moving the standards of the network performance qualities like turnout, finish to finish Delay, operating cost and magnitude relation of Packet Delivery. In the existing system, the improved EEEMR Protocol is enforced with clustering algorithm. But, in the proposed model of the system they considered the SLM algorithm with the combination of EEEMR protocol and implemented the considered network model. The performance of the model considered was analyzed by considering various network performances analyzing metrics. By analyzing these considered metrics, the performance of the model can be understood and explained in detail. During this paper, they tend to area unit implementing sensible native Moving algorithmic program in EEEMR Protocol. The event of cluster primarily based sensing element networks cover in recent times exposed to reduce the congestion in networks, system delay, operating cost and increase the system turnout and packet delivery magnitude relation. Some graphical representation was observed in the section of results for the comparison of the both the systems considered in terms of the various network performance metrics. The currently considered network model was expected to be increase the life time of the network with the incorporation of the EEEMR protocol with new SLM algorithm instead of the EEEMR protocol with the combination of clustering algorithm. The performance was studied by using the simulation on NS2 simulator and results shows that the projected system is better than the prevailing system. The projected system energy utilization is diminished when compared to the prevailing system.

The paper “Implementation of an Optimal Control System of Distributed Power Using Microgrid Based Load Prediction Method” proposes an optimal control scheme of distributed power using load prediction model for the efficient operation and management based on microgrid technology. The microgrid network as one type of energy networks can be used to supply the electrical or heat energy efficiently, which can be applied to an external power network controlled by an energy management system (EMS) or to the form of a small renewable energy network that operates independently. The proposed system is designed to operate according to the charging and discharging plan for energy storage devices, and it is implemented to maximize optimal control of distributed power source for the efficient operation and management based on microgrid technology. Finally, performance evaluation of the proposed system was performed considering weather data and power load prediction.

In this paper “Convergence Hybrid Network Design for Advanced Multicast and Broadcasting Service based on Mobility Context Awareness Networks: Part II Performance Testing and Analysis CAA Algorithm for Quality of Service”, a Context Awareness Algorithm for HFPMPv6 (CAA-HFPMPv6) in order to optimize the multimedia data load distribution according to network situation recognition is proposed. This mechanism is for the cross-layer algorithm design between L2 / L3. For this, the Advanced Mobile Anchor Point (AMAP) concept which is an extension of the
The hierarchical management method proposed in HMIPv6 (RFC 5380) is introduced. In addition, the Inter Access Point Protocol is used to efficiently manage the network resources through intelligent handover target decision upon handover request, and reverse binding mechanism is used to simplify the handover procedure. Finally, the terminal is assumed to be located between AP overlapping areas of access routers under domain influence.

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