JOURNAL OF TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY

Preface

This issue of the *Journal of Telecommunications and Information Technology* aims at documenting state of the art research, new developments, and directions for future investigation in the field of wireless networks. The issue contains twelve articles of researchers at the beginning of their career as well as works of renowned scientists, presenting their contributions to a broad range of topics related to wireless networks. The topics cover subjects ranging from various applications of wireless networks, architectures of wireless mesh networks, analytical and simulation methods for modeling wireless networks, to new protocols and devices for wireless networks.

This issue is opened by the article *Ubiquity of Client Access in Heterogeneous Access Environment* by Krzysztof Gierłowski. It presents an extensive overview of new mechanisms and technologies used to provide ubiquity on network access in heterogeneous environment of today's access systems. It also takes the discussion of challenges which must be addressed while attempting to fulfill topics such as handover control and mobility management.

The problem of mobility and handover management is also addressed in the second article, entitled *Evaluation of the Delay-Aware NUM-Driven Framework in an Internetwork Environment*. The authors: Maciej Urbański, Mateusz Poszwa, Paweł Misiorek and Dario Gallucci present a new architecture for handover management in multi-service wireless mesh networks. The proposed solution consists of DANUMS (Delay-Aware Network Utility Maximization) and WiOptiMo systems. The systems cooperate by exchanging measurements of transmitted traffic in order to improve the network utility as well as to optimize seamless handovers. The high effectiveness of the proposed architecture has been evaluated in a dedicated test-bed.

Tomasz Bilski in his paper *New Threats and Innovative Protection Methods in Wireless Transmission Systems* discusses several issues related to latest innovations in wireless communications systems, from the point of view of new threats and new vulnerabilities of this innovations. At the same time these new technologies may be used as new means for data protection. Cryptography, physical layer security, energy usage, handover, secrecy capacity and out-of-band authentication issues have been raised in this article.

In the next paper, *Lessons Learned from WiMAX Deployment at INEA*, Karol Kowalik, Dawid Dudek, Michał Kołodziejski, Bartosz Musznicki, Eugeniusz Grzybek and Jacek Jarzina share their experience related to deployment of broadband WiMAX-based service in Wielkopolska region with the readers. The experience gained during the deployment

of connectivity for Internet and telephony services to around 5,500 households across the 30,000 sq. km region concerns accuracy of theoretical propagation models, quality of service features in 802.16e standard, and techniques for throughput maximization in multi-path environment.

The authors of the article *DVB-T Channels Measurements for the Deployment of Outdoor REM Databases* focus on outdoor measurement of the spectrum occupancy in the TV band, in Poznań (Poland) and Barcelona (Spain). Adrian Kliks, Paweł Kryszkiewicz, Krzysztof Cichoń, Anna Umbert, Jordi Perez-Romero and Ferran Casadevall evaluated stability of the TV channels in both cities, during both drive-tests and indoor measurements. The obtained results allow for further works on TV White Space Communications Systems.

The present issue of the Journal also includes the article *Adaptive Algorithms Versus Higher Order Cumulants for Identification and Equalization of MC-CDMA* by Mohammed Zidane, Said Safi, Mohamed Sabri, Ahmed Boumezzough, and Miloud Frikel. The authors provide the results of a comparative study of blind and adaptive algorithms, elaborated for Multi-Carrier Code Division Multiple Access (MC-CDMA). The effectiveness of both groups of algorithms has been evaluated in a simulation environment, by calculating bit error rate for different values of SNR.

A new method for traffic characteristics estimation in cellular systems with Wideband Code Division Multiple Access (W-CDMA) radio interface is proposed by Ioannis D. Moscholios, Georgios A. Kallos, Maria A. Katsiva, Vassilios G. Vassilakis, and Michael D. Logothetis in the article *QoS Equalization in a W-CDMA Cell Supporting Calls of Infinite or Finite Sources with Interference Cancelation*. The authors consider a multirate loss model for the calculation of time and call congestion probabilities in a W-CDMA cell. According to this model, the calculation of time and call congestion probabilities are based on approximate but recursive formulas, whose accuracy is verified through simulation experiments.

Test-beds, emulation and simulation environments for wireless networks are described in the next two papers. In the article: *On IPv6 Experimentation in Wireless Mobile Ad hoc Networks* by Monika Grajzer and Mariusz Głąbowski selected topics on performing IPv6 protocols experimentation in wireless, IPv6-only mobile ad hoc networks (including both simulation and testbed-based evaluation) are presented. The selection of open-source simulation environments is presented and the comparison of simulation and emulation experimentation methods is provided.

The authors of the paper *Review of Simulators for Wireless Mesh Networks*, Piotr Owczarek and Piotr Zwierzykowski, present issues related to the simulation tools and the main advantages of simulation techniques. In order to help researchers in selection of an appropriate simulation environment, the authors present statistical information gathered during a literature survey of a number of research articles from the most popular publishers in which the selected simulators were used in initial system design.

The next two articles propose new routing protocols for wireless networks. Takuma Koga, Kentaroh Toyoda and Iwao Sasase in their article *Priority Based Routing for Forest Fire Monitoring in Wireless Sensor Network* propose a new protocol for forest fire monitoring system. The main aim of their study was to lower the probability of packets' loss and to lower end-to-end delay. These goals were achieved by elaborating a new priority policy routing methodology.

In the article entitled *On-demand QoS and Stability Based Multicast Routing in Mobile Ad Hoc Networks*, P. I. Basarkod and Sunilkumar S. Manvi propose quality of service and stability based multicast routing protocol for real time applications offered in MANETs. This on-demand protocol, called OQSMR, utilizes information sent between neighboring nodes, including node and link stability factor, bandwidth availability and delays. The effectiveness of the proposed protocol has been evaluated in a simulation environment.

In the last article *Design of a Superconducting Antenna Integrated with a Diplexer for Radio-Astronomy Applications*, Massimo Donelli and Pascal Febvre present the design of a compact receiving front-end diplexer, optimized for radio-astronomy applications. At the design stage of the diplexer, an evolutionary Particle Swarm Optimization algorithm has been applied. The authors fabricated the diplexer prototype which confirmed a good accuracy of numerical and experimental results.

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Guest Editors