

JOURNAL OF TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY

Preface

The growth of today's telecommunications induces wide spectrum of obstacles on various layers, from management of large networks with thousands of nodes to physical aspects that touch singular links. The current issue of *Journal of Telecommunications and Information Technology* brings a set of eleven articles that cover just such a broad range of problems.

The first four papers focus on issues related with network-operator level. To begin with, the article *Traffic Engineering in Software Defined Networks: A Survey* by M. R. Abbasi, A. Guleria and M. S. Devi gives an overview over traffic engineering methods, which are intended to optimize a network and improve network robustness. In addition to classic techniques, the authors present the state of the art in traffic engineering solutions proposed for novel network architecture, which is Software Defined Networking (SDN). They also highlight the research challenges and future directions for SDN-based traffic engineering.

G. Zalewski and W. Ogryczak in their article *Network Dimensioning with Maximum Revenue Efficiency for the Fairness Index* propose a new optimization method that maximizes the total flow on given pairs of nodes. The feature of the method is that it takes into account a revenue factor together with fairness criteria, thus preventing the problem of starvation of less attractive paths.

Optimization is also the subject of the third article, entitled *Hybrid Models for the OWA Optimization*. P. Olender analyzes the so-called Ordered Weighted Averaging (OWA) optimization models and introduces new general formulations for them. Furthermore, the author proposes some simple valid inequalities to improve the computational performance. Presented numerical results illustrate that in the case of certain problem types, the proposed hybrid formulations outperform other general models presented in literature.

The Economic Value Added (EVA) indicator allows for measuring company efficiency showing the income after deduction of full costs of capital. W. Kamieniecki in the article *EVA as a Tool for Estimation of Management Efficiency and Value Creation in Polish Telecom Sector* studies the usefulness of the EVA analysis for evaluation of telecom companies. Obtained results indicate that EVA sign and magnitude are in agreement with indicators based on data from financial books. In addition, the author investigates the effectiveness of using EVA for prediction of telecom's market capitalization with the conclusion that EVA cannot be considered as a more effective indicator of company value than other commonly used indicators.

The next three papers are devoted to applications of telecommunication systems, as Internet of Things and Intelligent Transport Systems. Vision of Internet of Things (IoT) binds the digital world with the real one, and IoT services will actively benefit from information about the physical environment. This information is collected through diverse sets of interconnected sensors, which exchange data without human interaction. Taking into account the limited capabilities of devices, such sensor networks require different mechanisms compared to traditional telecommunication networks. K. Bronk, A. Lipka, B. Wereszko, J. Żurek and K. Żurek in their paper *Self-organization and Routing Algorithms for the Purpose of the Sensor Network Monitoring Environmental Conditions on a Given Area* describe their implementation of wireless sensor network, which was designed to gather information about environmental conditions on a defined area. They selected the KNeighbours algorithm to provide self-organization feature in their network, and proposed own routing algorithm, which jointly with modifications of MAC layer introduced to network nodes, increases network efficiency and helps maintain connectivity in the network.

In many emerging IoT applications, such as smart cities or smart transportation, obtaining information about precise location of involved users or objects plays a key role. M. Frikel, S. Safi and Y. Khmou in their article *Focusing Operators and Tracking Moving Wideband Sources* investigate a new method for localization of mobile terminals, which bases on estimation of two DOA (direction of arrival) by using two different arrays of sensors. In addition, they propose an algorithm for prediction of the trajectory of moving terminal, which exploits ARMA model. Presented simulation results illustrate effectiveness of the method to estimate location and trajectory of moving terminal operating in GSM band.

One of the areas in which IoT can be of great importance is Intelligent Transport Systems (ITS). M. Kowalewski and A. Pękalski in their article *Implementation of Standardized Cooperation Environment for Intelligent Transport Systems* provide a comprehensive overview of standards related with ITS communication model, with special focus on European Standards.

Securing computer networks is considered one of the biggest challenges nowadays. Intrusion Detection System (IDS) is a technology that monitors network and/or computer system for security violations. In the article *L-SCANN: Logarithmic Subcentroid and Nearest Neighbor* T. Ahmad and K. Muchammad investigate a method for data classification in IDS. By reducing the search space in training data, the authors achieve higher efficiency of their IDS, in terms of lower processing time and greater accuracy, compared with IDS that uses known TANN method.

The next two papers are devoted to the issues of the physical layer of OSI model. R. Singh and M. Rawat in their article *Closed-form Distribution and Analysis of a Combined Nakagami-lognormal Shadowing and Unshadowing Fading Channel* deal with modeling problem of the realistic wireless channels that face shadowing and unshadowing fading in wireless signal propagation. The authors propose a new closed-form probability distribution function of a Nakagami-lognormal model of fading channel, which next allows them to derive the closed-form expression of combined Nakagami-lognormal shadowing and unshadowing fading. The obtained result facilitates carrying out the performance evaluation of wireless communication links.

T. Kossek, D. Czulek and M. Koba in *Long-term Absolute Wavelength Stability of Acetylene-stabilized Reference Laser at 1533 nm* measure the frequency of a laser emitting light in 1550 nm region against optical frequency of commercially available comb generator. Accurate optical frequency standards are important tool in development of fiber optic telecommunications. The authors propose the measuring method that provides high accuracy and high flexibility compared with methods presented in literature.

The last paper *Verification of Staff Proficiency in the Calibration Laboratory on Voltage, Frequency, Resistance and Capacity Measurements* by A. Warzec, M. Marszalec, and M. Lusawa, is concerned with determination of most appropriate algorithm of staff proficiency verification. The authors, with many years of experience gained in the Laboratory of Electrical, Electronic & Optoelectronic Metrology in National Institute of Telecommunications, present measurement systems used for verification, analysis of results or simulations, and show conclusions for selecting best solution.