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Editorial: Special Issue on "Wireless Future"

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The IEEE International Symposium on Wireless Communication Systems 2007 (ISWCS'07) was held in Trondheim, Norway, 16–19 October 2007. It was the fourth conference in series and provided a platform for wireless communication researchers and technologists to identify and discuss technical challenges and business opportunities in the area of wireless communications.

Wireless communications is in the focus of a new and passionate era for telecommunications characterized by the convergence of systems and technologies, a transition towards all-IP networks, and the development of user-centered technologies. Wireless communications is far more than mobiles and 3G systems. It is reshaping the way we communicate and comes in all shapes, sizes, and applications, ranging from wide-area WiMAX to local-area Wi-Fi, from short range UWB and RFID to personal-area Bluetooth and ZigBee, from mobile ad hoc to wireless sensor networks, from broadband to cognitive radio, and from GPS and navigation to emerging machine-to-machine (M2M) and object-to-object (O2O) applications. This paradigm is fascinating in many aspects. It is not only about connecting people anytime anywhere, but also about connecting machines or objects to each other. Wireless communications is opening up a new horizon of possibilities and applications that will change the way we live, work and, of course, communicate in the future.

This special issue is based on a selection of the best papers presented at the ISWCS'07. Among them nine papers have been selected, including one awarded paper. All selected papers were then revised and re-submitted before they underwent the usual peer-review process. This special issue presents the result of the stringent selection process in form of nine high-quality papers, covering a large range of topics from physical layer to higher layer issues.

The first paper, "A Study of the Influence of Shadowing on the Statistical Properties of the Capacity of Mobile Radio Channels," by G. Rafiq and M. Pätzold, is a fundamental research paper that investigates the influence of shadowing on the statistical properties of the channel capacity. It is shown that the shadowing effect influences significantly the variance and the

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maximum value of the distribution of the channel capacity, but it has nearly no impact on the mean channel capacity.

The second paper "Characterization of Vehicle-to-Vehicle Radio Channels from Measurements at 5.2 GHz", by A. Paier, J. Karedal, N. Czink, C. Dumard, T. Zemen, F. Tufvesson, A. F. Molisch, and C. F. Mecklenbräuker, is one of the few papers that can be found in the open literature which report on measurement results of vehicular-to-vehicular (V2V) radio channels. It presents measurement results of the pathloss, power-delay profiles, and delay-Doppler spectra on a typical highway at a carrier frequency of 5.2 GHz. With the measurement results, the authors contribute to a deeper understanding of V2V channels, which is not only of great importance for the performance evaluation of existing systems, e.g., IEEE 802.11p, but also for the development of future intelligent V2V communication systems.

The third paper, "Diversity Performance of Multimode Antennas in Directive Angle of Arrival Scenarios," by O. Klemp and H. Eul, depicts an important theoretical framework for the analysis of the diversity efficiency of multimode antennas in directive angle-of-arrival scenarios. It provides an in-depth study of the impact of finite pattern correlation and branch power imbalances on the diversity efficiency of multimode antennas.

The fourth paper, "Link Performance of an ESPAR-Antenna Array in Rich Scattering and Clustered Channels," by R. Bains and R. R. Müller, evaluates the performance of an electronically steerable passive array radiator (ESPAR). The performance gain of an ESPAR-antenna in terms of spectral-efficiency is investigated for two typical kinds of channels: rich scattering channels and clustered channels. For rich scattering channels, the performance gain of ESPAR-antennas is also evaluated in terms of the symbol error rate.

The fifth paper, "On the Minimization of Communication Energy Consumption of Correlated Sensor Nodes," by L. Yin, C. Wang, and G. E. Øien, aims to minimize the energy consumption of wireless sensor networks. An optimization algorithm is proposed that enables the minimization of the overall energy consumption of the hardware and the physical link. The proposed scheme is significant as it allows to increase the lifetime of a wireless sensor network considerably.

The sixth paper, "On Achievable Data Rates and Optimal Power Allocation in Fading Channels with Imperfect Channel State Information," by K. Almustafa, S. Primak, T. Willink, and K. Baddour, studies the maximum achievable data rates of wireless communication systems with pilot-based channel estimation schemes. In practice, the achievable data rates are limited not only by noise, but also by channel estimation errors. Taking this into account, the authors derive analytical expressions for the achievable data rates of several pilot-based channel estimators. An optimal power control scheme for a fading channel with imperfect channel state information is also proposed.

The seventh paper, "Sub-Carrier and Band Hopped Orthogonal Frequency Division Multiple Access (OFDMA) Systems," by M. I. Rahman, R. Reynisson, D. Figueiredo, and R. Prasad, proposes to combine sub-carrier hopping and band hopping in OFDMA systems. The novel system is introduced as a so-called sub-carrier and band hopping OFDMA (SCBH-OFDMA) system. It is shown that SCBH-OFDMA systems are superior to random-hopping and static-allocation-based systems.

The eighth paper, "Call Admission Control Algorithms in OFDM-Based Wireless Multiservice Networks," by Y. Zhang, Y. Chen, J. He, C.-X. Wang, and A. V. Vasilakos, discusses four call admission control algorithms for OFDM-based broadband wireless access systems. It analyzes the performance trade-off among various call admission control schemes. This study provides an important framework for planning next-generation OFDM-based wireless multiservice networks.

Finally, the ninth paper, "Consumer-Oriented Incoming Call Connection Service for a Ubiquitous Consumer Wireless World," by I. Ganchev, M. O'Droma, and N. Wang, presents an architecture and a protocol infrastructure for a novel consumer-oriented incoming call connection (ICC) service. It describes the main components and interfaces of the ICC service architecture and infrastructure, and suggests proper protocol candidates.

We wish to express our sincere thanks to all authors of the selected papers and to the reviewers for their constructive comments and suggestions to improve the quality and the presentation of the papers. Our particular thanks go to Cindy Zitter and Jeroen Terpstra from the Springer Editorial Department for assisting in the preparation of this special issue.