
Editorial

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Biographical notes: Yan Zhang received his PhD from the School of Electrical and Electronics Engineering, Nanyang Technological University, Singapore. Since August 2006, he is working with Simula Research Laboratory, Norway. He is currently heading the 'Wireless Networks' research group at Simula Research Laboratory, Norway. His research interests include resource, mobility, spectrum, data, energy and security management in wireless networks and mobile computing.

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Athanasios (Thanos) Vasilakos is currently a Professor in the Department of Computer and Telecommunications Engineering, University of Western Macedonia, Kozani, Greece. He is a Chairman of the Intelligent Systems Applications Technical Committee (ISATC) of the IEEE Computational Intelligence Society (CIS). He served or is serving as an Editor or/and Guest Editor for many technical journals, such as *the IEEE TRANSACTIONS ON SYSTEMS, MAN, AND CYBERNETICS-PART B*, *the IEEE TRANSACTIONS ON INFORMATION TECHNOLOGY IN BIOMEDICINE* and *the IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS*. He is a founding Editor-in-Chief of the *International Journal of Adaptive and Autonomous Communications Systems* (IJAACS, <http://www.inderscience.com/ijaacs>) and the *International Journal of Arts and Technology* (IJART, <http://www.inderscience.com/ijart>).

Cheng-Xiang Wang received the PhD from Aalborg University, Denmark, in 2004. He has been with Heriot-Watt University, Edinburgh, UK since 2005, first as a Lecturer and then as a Reader in 2009. His research interests include wireless channel modelling/simulation, cognitive radio networks, vehicular communication networks, green communications, cooperative communications, MIMO and (beyond) 4G wireless communications. He has published 1 book chapter and over 120 papers in journals/conferences. He served or is serving as an (Guest) Editor for several journals including *IEEE Transactions on Wireless Communications* and *IEEE Journal on Selected Areas in Communications*.

Zhifeng Tao received his PhD in Electrical Engineering from Polytechnic Institute of New York University. He joined Mitsubishi Electric Research Laboratories in 2006 and currently holds the position of principal member of technical staff. He has played a key role in the development of such IEEE standards as 802.16j, 802.16m and P2030. He has published over 40 papers, filed more than 60 US patents and written several book chapters. He is a Guest Editor of *IEEE Communications Magazine* and *EURASIP Journal on Advances in Signal Processing*. He is also the co-chair of IEEE International Smart Grid Communications Workshop.

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Welcome to this Special Issue of the *Int. J. Autonomous and Adaptive Communications Systems (IJAACS)*. This Special Issue is devoted to the topic of the latest research and development in the field of cognitive radio systems, communications and networking. This issue called for papers in various aspects of the recent advances in the cognitive radio networks. In this Special Issue, we selected three papers to show the recent advances. The papers cover protocols, game theoretical model, security and implementations, all of which are very important for the development of cognitive radio systems. A detailed overview of the selected works is given below.

In 'Energy control game model for dynamic spectrum scanning', the authors present a model for distributed spectrum sensing within a non-cooperative game theoretic approach for a cognitive radio network. Group of unlicensed cognitive radios operating over the same spectral band constitute the players; where the group goal is overall energy efficiency and effective use of the available spectrum. Effective use of the spectrum is governed by the ability of individual radios to estimate the usage of spectrum. Each player acquires this information by scanning the spectrum and from the information shared by other players in the group. To accomplish the group objective of gaining accurate spectral information at minimal energy consumption, it is imperative that the number of scanning radios be minimised. Rules of this non-cooperative game are defined in order to maintain the balance between the individual pay-offs and group objective.

In 'A novel common control channel security framework for cognitive radio networks', the authors presents a novel common control channel security protocol for cooperatively communicating cognitive radio networks. An implementation of the proposed security protocol is discussed illustrating how two cognitive radio nodes can authenticate each other prior to any confidential common control channel negotiations. The protocol is formally validated by GNY logic and a security analysis of the protocol illustrates that it meets the principal security requirements of authentication, confidentiality, integrity and non-repudiation.

In 'Optimal set of LFSR common operators for multi-standards cognitive radio terminals', the authors describe the linear feedback shift register (LFSR) as a common operator (CO), which is one of the first implementations of common operator technique in parameterisations.

The study explains four developed common architectures to design 16 LFSR COs that can carry out several operations of multi-standard CR receivers. The detailed implementation is given on Altera Cyclone II. Based on the foundation of the common operators, the paper also describes a procedure which identifies an architecture that minimises the cost of the radio. Results obtained by optimisation validate the implementation results.

We would like to express our gratitude to the Editor-in-Chief, Prof. Athanasios Vasilakos for his advice, patience and encouragements since the beginning until the final stage. We thank all anonymous reviewers who spent much of their precious time reviewing all the papers. Their timely reviews and comments greatly helped us to select the best papers in this Special Issue. We also thank all the authors who have submitted their papers for consideration for this issue. A special thank goes to Liz Harris, who made a great effort on the production of this issue.