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Special Issue on Smart Cities, Optimization and Modeling of Complex Systems

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PAPERS

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PREFACE:

The transformation to Smart Cities is mainly driven by the need to create urban sustainability. By Integrating the knowledge from different technology centric scientific fields related to information and communication technologies (ICT), data analytics, smart control and smart sensing it becomes possible to focus on the human and environmental centric aspects of a smart city like the ecological integrity and social equity. Contemporary technological frameworks are being developed which combine electronic and cyber physical aspects to collect and process large information streams that are created. Innovative electronic devices which push the technological boundaries are needed as part of those frameworks. Hence, the corresponding smart infrastructure (e.g., for power grid, and water conservancy, etc.), requires manipulating dense data using complex transportation or /communication systems, for the related social and -economic organizations in cities are complex systems in essence. The dependencies, competitions, or and other types of interactions between their parts these constituencies in a complex system make its behavior inherently difficult to model and optimize. Motivated by further improving the quality of urban services, the planning of smart cities and the required modeling and optimization of the related complex systems are full of challenges.

This special issue documents the most recent advances in smart cities and the modeling/optimization of the required complex systems. It is a comprehensive issue, which covers information and communication technologies, social networks, Internet of things (IoT), complex systems, smart healthcare, and traffic/ transportation systems.

In fact, this special issue is a collection of the papers which cover the topics pertaining to smart cities and the implied complex systems modeling and optimization. After a careful peer review process, we have retained five articles.

The first paper is entitled “Parametric study and optimization of a dual-band four port Wilkinson Power divider.” The authors proposed a dual-band Wilkinson Power divider (WPD) with four output ports and an optimization method of WPD based on genetic algorithm. The proposed WPD circuit exhibits good characteristics at WLAN frequencies (2.45GHz & 5.8 GHZ) in terms of return loss and isolation.

The second paper is entitled “Alcohol use disorders automatic detection based BCI systems: A novel EEG classification based on machine learning and optimization.” The authors developed a system for diagnosing alcoholism using machine learning algorithm. The proposed system uses a bandpass filter to remove all unused signal frequencies, and the use of genetic algorithm and Extra-Trees algorithm make it possible to quickly generate prediction models with better accuracy values and minimize the number of the electrodes.

The third paper is entitled “Low complexity demapping algorithms survey in DVB-T2: Rotated constellation case study.” The authors presented an exhaustive review of demappers proposed for DVB-T2 and all the low complexity demapping algorithms existing up to now in the literature that is suitable for hardware implementation. Details about these algorithms are given

in terms of reduction, parameters, performance and percentage of reduction obtained.

The fourth paper is entitled "On the performance of non-coherent CFAR detectors in sea-clutter: A comparison study." The authors investigated the performances of non-coherent logt-CFAR, zlog(z)-CFAR and Bayesian-CFAR detectors using both simulated and real data. Their work studied the dependence of the false alarm probability associated to each detector, and showed that existing CFAR algorithms provide fully CFAR decision rules.

The fifth paper is entitled "Failure correction of linear antenna arrays with optimized element position using Grey Wolf Algorithm." The authors proposed a failure correction method of linear antenna arrays with optimized element position using Grey Wolf algorithm. The proposed method re-adjusted weights amplitude and phase distribution of the lasting working elements in a faulty array, and performed several case studies involving different types of faults.

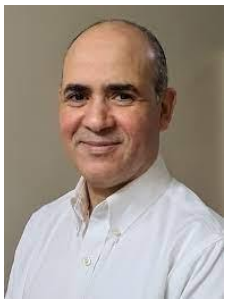
Acknowledgements:

The guest editors would like to acknowledge all authors who submitted their papers to this special issue for their hard work and valuable scientific contributions. Furthermore, we are truly grateful to our strong core of thoughtful reviewers who dedicated their time to providing valuable comments and feedback that were vital to the improvement of the quality of the accepted contributions. Our sincere thanks go to the journal Editor-in-Chief, Professor Mohammed El Mohajir, for giving us this opportunity to publish this special issue. We hope that the collective work of the papers in this special issue stimulates readers' enthusiasm and inspires them toward their own ongoing research.

GUEST EDITORS BIOGRAPHIES

Yassine Salih Alj received the Bachelor's degree in microelectronics from the University of Quebec at Montreal (UQAM), Montreal, Quebec, Canada, in 2001, and the Master's degree in electrical engineering from the École de Technologie Supérieure (ETS), Montreal, Quebec, Canada, in 2003, and the Ph.D. degree in Telecommunications from the National Institute of Scientific Research – Energy, Materials & Telecommunications (INRS-Telecom), Montreal, Quebec, Canada, in 2008. He served as a research assistant at the Telebec Underground Communications Research Laboratory (LRTCS) from 2005 to 2008, and then during 2009 as a Postdoctoral Fellow at Poly-Grames Research Center, of the École Polytechnique de Montréal, Montreal, Quebec, Canada. He is currently working as a permanent faculty member at the School of Science and Engineering (SSE) of Al Akhawayn University in Ifrane (AUI), Morocco. He has published over 50 publications and has been actively involved in IEEE events for the past five years, where he chaired and served as Technical Program Member or as distinguished reviewer for over 100 conferences. His research interests are in the areas of Wireless Communications, Indoor Positioning, UWB (Ultra-Wideband), Digital System Implementation, GPS (Global Positioning System) and Engineering Education.

Fei Yan is an Associate Professor and doctoral supervisor at the School of Computer Science and Technology at Changchun University of Science and Technology, China. He received his doctorate in Engineering and then worked as a postdoctoral fellow at the Department of Computational Intelligence and Systems Science at Tokyo Institute of Technology, Japan. His current research interests include computational intelligence, quantum information processing, and medical image analysis.



Abdellah Touhafi is professor at the Engineering Sciences Faculty of the Vrije Universiteit Brussel. As member of the Engineering technologies department, he is responsible for the major courses related to electronics design, embedded computing and reconfigurable computing. His research interests are smart and industrial electronics, reconfigurable computing systems, multi-sensorial systems and cloud computing. Those topics are deployed within two emerging applications that are advanced environmental monitoring systems and digital education. His scientific work has been published in more than 130 scientific publications. He is serving as an editor for the Journal of sensors and the journal of remote sensing. He is also chairing several conferences related to smart cities, cloud computing and industrial electronics. He is a member of IEEE Industrial Electronics Society and IEEE Education Society.