Foreword by Guest Editors for the Special Issue on the 2014 International Conference on Mobility for Life: Technology, Telecommunication and Problem Based Learning (TTPBL)

**Bhawani Shankar Chowdhry¹ · Javier Poncela² ·
Muhammad Aamir³**

Published online: 17 May 2015

© Springer Science+Business Media New York 2015

Welcome to this special issue of wireless personal communications. This special issue comprises a selection of best papers from the Third International Conference on Mobility for Life: Technology, Telecommunication and Problem Based Learning (TTPBL). This 4-day event provided a dynamic platform for experts, scholars, higher education policy makers and private sector parties from Europe, Asia and other parts of the world to exchange ideas, research findings, innovations, best practices, lessons learned and challenges encountered throughout the research process, as well as the implementation of technology, telecommunication and problem-based learning.

In order to share an understanding of problem-based learning both in theory and practice, with higher education personnel from Europe and Asia, particularly participating in the Erasmus Mundus Project and implementing PBL in their institutions, an exchange of innovative knowledge and research findings in the fields of technology and telecommunications were shared at threadbare level. In addition, this event aided in deriving information on good practices and knowledge on its each theme for dissemination to the academic community as well as to the private sector and helped in generating a network of scholars in the fields of PBL, technology and telecommunication.

✉ Bhawani Shankar Chowdhry
bhawani.chowdhry@faculty.muuet.edu.pk

Javier Poncela
javier@ic.uma.es

Muhammad Aamir
maamir@ssuet.edu.pk

¹ Faculty of Electrical Electronics and Computer Engineering, Mehran University of Engineering and Technology (MUET), Jamshoro, Pakistan

² ETSI Telecomunicación Engineering, University of Malaga, Campus de Teatinos, Malaga, Spain

³ Department of Electronics & Telecommunication Engineering, Sir Syed University of Engineering & Technology, Karachi, Pakistan

All these papers have been extended as proceedings of TTPBL Conference had already published online in IEEE digital library. The review process ensured that each paper should contain new material. The TTPBL Conference was held at Aalborg University, Denmark, within the Global Wireless Summit during 11–14 May 2014. The 15 best papers are selected for this special issue.

The first paper entitled “Robust Controller Design for Satellite Attitude Determination, Stabilization and Control using LQG/LTR”. It describes a controller design for a small satellite using QUEST algorithm and robustness of the design is achieved using LQG/LTR feedback. The orbital path is driven by the interactions between a magnetometer’s coils and earth’s magnetic field.

The second paper entitled “Performance Measurement of Free-Space Optical 980 nm channel using multiple sets of Environmental conditions”. In this paper the performance of free space optical (FSO) link is investigated in the presence of hot and dry weather. Authors make use of a portable test-bed setup for the measurement campaign.

The third paper entitled “Analysis of MAC strategies for underwater applications”. The unique properties of the UW acoustic communication path necessitate the need for new efficient, reliable MAC protocols to meet the challenges of propagation delay, multipath and fading and excessive power absorption. This paper surveys the state of the art on MAC protocols tailored for underwater acoustic communications and discusses performance achieved in the different mechanisms.

The fourth paper entitled “Performance evaluation of MANET routing mechanisms”. Routing protocols play a pivotal role in energy-efficient, reliable and robust communication in Mobile Ad hoc Networks (MANETs). The performance of several of these protocols (AODV, DSR, DSDV) is evaluated for different network sizes and traffic load, in terms of packet delivery ratio, end-to-end delay, average remaining energy of nodes, and throughput.

The fifth paper entitled “Comparative analysis of VANET Routing protocols—On road side unit placement strategies”. This work analyses the performance of proactive and reactive routing protocols when direct communication between vehicles is not possible and intermediate infrastructure is needed. Various placement strategies of relay stations are evaluated in urban scenarios.

The sixth paper entitled “M2M challenges and opportunities in 4G”. The profile of machine type communications is quite different from human communication services due to their bursty nature and small payload. Signaling procedures cause a significant overload on the network. The paper reviews current literature, commenting on challenges and improvements in LTE technology.

The seventh paper entitled “An anti-cropping watermarking method for facial image using prediction and weber ratio techniques”. This work focuses on the analysis of ownership of facial images that are published, possibly cropped, without the owner’s permission. A watermarking method, robust against cropping attacks is proposed. Evaluation is performed using phase correlation technique to embed the watermark. Experimental results are provided for JPEG compressed images.

The eighth paper entitled “An Efficient Hybrid Cryptographic Algorithm, consuming less time for exchanging information in Wireless Sensor Networks”. Authors analyze a symmetric-asymmetric cryptographic algorithm in order to provide proper security for part of the transmitted data, while rest of the packet is less protected. In this way, power efficiency is improved at the cost of decreasing the security for those data that don’t require the highest level of protection. Tests are performed on the SPIN protocol, and compared metrics are obtained.

The ninth paper entitled “IntelCity, Multiplatform development of information access platform for smart cities”. Cities are turning into smart at fast pace, and citizens and managers are interested in access to new services in automated ways. Information is usually stored in heterogeneous systems, with no unified interface. In this trend, the paper presents a multiplatform tool to access information available in a city at different levels of detail based on the group of interest.

The tenth paper entitled “Designing and Implementation of Industrial Process Control and Monitoring System using Fuzzy PID and WSN”. This paper is in the scope of problem based learning methodology, and it addresses a control design problem for a two tank system with the aim of helping learning of graduate and undergraduate control students. The mathematical modeling is presented and a real-time simulation model is provided. Industrial parameters are controlled by Fuzzy PID controller.

The eleventh paper entitled “Experimental Evaluation of Vibration Response based Bridge Damage Detection using Wireless Sensor Networks”. Transport infrastructure is also becoming verbose thanks to small wireless motes. This paper analyses the deployment of accelerometers to collect the vibration response from bridges. Collected data is compared with responses when intact and damages may be detected.

The twelfth paper entitled “Hardware implementation and testing of reconfigurable RTU for Wireless SCADA”. An RTU design suitable for wide area operation in industries such as oil, gas and power is presented. The design is based on FPGA for reconfigurability and features wireless communication; overall performance is similar to commercial hardware but better cost effectiveness.

The thirteenth paper entitled “IoT's enabled active contour modeling based energy efficient and thermal aware object tracking on FPGA”. Authors present a work that could help track objects in 3D space. Thermal stability is assessed when temperature varies from 30° to 70°.

The fourteenth paper entitled “Analyzing the impacts of distributed generation integration on distribution network: A corridor towards smart grid implementation in Pakistan”. The use of renewable power sources is progressing faster and faster. This paper analyses the impacts caused on power losses and voltages of the power distribution network in different interconnection strategies. An implementable smart grid system is proposed for emerging countries, where resources and funding are usually tightly constrained.

The fifteenth paper entitled “Online Mentoring Model by Using Compatible Different Attributes”. This last paper addresses online learning. Focused on learning methodologies, this last paper studied if compatible attributes between mentor and mentee can be used in online environments, so that appropriate mentors can be found. The model includes attributes such as professionalism, experience, knowledge, confidence and initiative. An empirical study conducted at Mae Fah Luang University is described and analyzed.

We would like to thank the Editor-in-chief (Professor Ramjee Prasad) and Springer's senior editorial assistant (Name to be inserted) for their support and help in realizing this special issue. Special thanks to all the authors for promptly revising their papers to meet the requirements of reviewers. Thanks to the all valued reviewers for contributing with their expert comments to improve selected papers. Hope you will have the benefit by reading this special issue.

Professor Dr. Bhawani Shankar Chowdhry is the Dean Faculty of Electrical Electronics and Computer Engineering and former Director IICT at Mehran University of Engineering & Technology (MUET), Jamshoro, Pakistan. He has the honour of being one of the editor of several books “Wireless Networks, Information Processing and Systems”, CCIS 20, “Emerging Trends and Applications in Information Communication Technologies”, CCIS 281, “Wireless Sensor Networks for Developing Countries”, CCIS 366, “Communication Technologies, Information Security and Sustainable Development”, CCIS 414, published by Springer Verlag, Germany. He has also been serving as a Guest Editor for “Wireless Personal Communications” which is Springer International Journal. He has produced more than 10 Ph.D.s and supervised more than 50 M.Phil./Masters Thesis in the area of ICT. His list of research publication crosses to over 60 in national and international journals, IEEE and ACM proceedings. Also, he has Chaired Technical Sessions in USA, UK, China, UAE, Italy, Sweden,

Finland, Switzerland, Pakistan, Denmark, and Belgium. He is member of various professional bodies including: Chairman IEEE Communication Society (COMSOC), Karachi Chapter, Region10 Asia/Pacific, Fellow IEP, Fellow IEEEP, Senior Member, IEEE Inc. (USA), SM ACM Inc. (USA). He is lead person at MUET of several EU funded Erasmus Mundus Program including “Mobility for Life”, “StrongTies”, “INTACT”, and “LEADERS”. He has organized several International Conferences including “IMTIC08”, “IMTIC12”, “IMTIC13”, “IMTIC15”, “WSN4DC13”, “IEEE SCONEST”, “IEEE PSGWC13”, and track chair in “Global Wireless Summit (GWS 2014).

Dr. Javier Ponzela received the M.Sc. degree in telecommunication engineering from the Polytechnic University of Madrid, Spain, in 1994 and the Ph.D. degree from the University of Málaga, Spain. He worked in Alcatel Spacio before joining the University of Málaga at the Communication Engineering Department. He has actively collaborated with multinational companies (Nokia, AT4wireless, Ingenia) on formal modeling and system testing in Bluetooth, UMTS and satellite systems. His research interests include underwater communication systems, methodologies for efficient development of complex communications systems and analysis of QoS over heterogeneous networks.

Dr. Muhammad Aamir received B.S. in Electronics Engineering in 1998 and MS degree in Electronic Engineering (with specialization in Telecommunication) in 2002. He accomplished his Ph.D. in Electronic Engineering from Mehran University of Engineering & Technology. During his PhD studies, he accomplished most of his research work at the University of Malaga under Erasmus Mundus Scholarship. He had authored and co-authored more than 25 research papers published in various journals and conferences of international repute. He was also awarded with a grant by the Ministry of Education Spain to teach at the University of Malaga which he availed in May 2012.