# Foreword by Guest Editors for the Special Issue on the 2013 International Conference on Mobility for Life: Technology, Telecommunication and Problem Based Learning (TTPBL)

**Bhawani Shankar Chowdhry · Javier Poncela · Rajendrakumar Giridharilal Tated · Sandeep Inamdar · Romyen Kosaikanont**

Welcome to this special issue of Wireless Personal Communications. This special issue comprises a selection of best papers from the Second International Conference on Mobility for Life: Technology, Telecommunication and Problem Based Learning (TTPBL). This 3-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, lesson 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 PBL for dissemination to the

B. S. Chowdhry (✉)
Faculty of Electrical, Electronics, Telecommunication and Computer Engineering,
Mehran University of Engineering and Technology, Jamshoro (MUET), Pakistan
e-mail: bhawani.chowdhry@faculty.muet.edu.pk; bsc_itman@yahoo.com

J. Poncela
Communication Engineering Department, Universidad de Malaga, Málaga, Spian
e-mail: javier@ic.uma.es

R. G. Tated
Shreeyash Pratishthan's, Shreeyash College of Engineering & Technology, Aurangabad, India
e-mail: rgtated@yahoo.com

S. Inamdar
Vishwa-Niketan / CTIF- India, Kharagpur, Navi Mumbai 410210, India
e-mail: ssinamdar31@rediffmail.com; jangurukal@gmail.com

R. Kosaikanont
Economics, School of Management, Mae Fah Luang University, Muang, Chiang Rai 57100, Thailand
e-mail: romyen@mfu.ac.th

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.

All these papers have been extended and reviewed again by three independent reviewers. The TTPBL Conference (sandipfoundation.org/ttpbl13) jointly organized by Sandip Institute of Engineering and Management and Aalborg University, Denmark together with the consortium of 18 universities from Europe and Asia under the Erasmus Mundus Mobility Programme at Sandeep Institute, Nasik, India during 14–16 March 2013. Sixty Five papers on the conference theme: Technology, Telecommunication and Problem Based Learning presented out of almost 300 abstracts submission. However, only twenty five best papers are selected for this special issue.

The first paper entitled "Performance of RAKE-LMMSE Receiver in Wideband Communication System". A simple MIMO receiver structure of LMMSE in downlink asynchronous direct-sequence code division multiple access is proposed in this paper. This paper investigates RAKE receiver characteristics and does the analysis of zero forcing and LMMSE equalizer for MIMO channels.

The second paper entitled "Performance Analysis of Relaying Strategies in Cooperative Diversity Scheme". In this paper the performance of Amplify-and-Forward (AF) and Decode-and-Forward (DF) relaying strategy with QPSK/BPSK modulation at transmitter and different combining methods at receiver is analyzed.

The third paper entitled "BECPA: Bandwidth Efficient Cluster Based Packet Aggregation in Wireless Sensor Network". This paper proposes novel Bandwidth Efficient Cluster based Packet Aggregation algorithm (BECPA) for heterogeneous WSNs. It combines the idea of variable packet generation rate (PGR) of each node with random data. The nodes are randomly distributed with different energy level and are equal in numbers. It uses the perfectly compressible aggregation function at cluster head (CH) based on the correlation of packets and data generated by each node.

The fourth paper entitled "A New Dynamic Energy Efficient Latency Improving Protocol for Wireless Sensor Networks". This paper presents the new protocol to overcome some drawbacks of the existing protocols. A concept of distance metric based routing is explored for shortest routing path selection. This helps to reduce the overhead of the network traffic, which results in improvement of energy efficiency and latency.

The fifth paper entitled "Quality Assessment in 3G/4G Wireless Networks". In this paper, a non-intrusive system is described for the analysis and measurement of Quality of Experience in wireless networks. The system consists of mobile agents running on the mobile terminals and one or more network entities that collect and analyze the information.

The sixth paper entitled "What about Spectrum Opportunities in 'Angle' dimension for Dynamic Spectrum Access in Cognitive Radio Network context?-A new Paradigm in Spectrum Sensing". The paper provides the detailed analysis of various AoA estimation algorithms like beamforming and subspace based, in AWGN channel and in time varying Rayleigh channel. Comparison included effect of number of antenna elements, number of samples, SNR and the wide and combined angular separation environment.

The seventh paper entitled "Framework for Analysis of Power System Operation in Smart Cities". The proposed framework is capable of analyzing emerging trends in power system operation in smart cities to make it more reliable. It can also be used to develop operational algorithms to optimize the generation, transmission and distribution schemes and taking advantage of smart infrastructure in a more effective manner.

The eighth paper entitled "Power Consumption Monitoring System for Indian homes". The objective of this important research was to propose a system which will record power

consumption of every device at home. In this paper, related literature is synthesized to design a proposed method of measurement and conceptual system architecture.

The ninth paper entitled "PBL FRAMEWORK for Enhancing Software Development Skills: An Empirical Study for Information Technology Students". This paper aims to study the PBL Framework for enhancing software development skills for undergrad students. The software development skills which are assessed in the framework are student learning efficiencyskill and the professional skills.

The tenth paper entitled "Scaling Number of Active Links in a Linux Kernel Bond Driver having Heterogeneous Network Interfaces". This paper proposes a novel solution that enables a multi-radio host to simultaneously utilize multiple heterogeneous wireless/wired networks. This solution is based on Linux Bonding driver shipped with Linux kernel.

The eleventh paper entitled "An IoT virtualization Framework for Fast and Lossless Communication". This paper proposes IoT applications and a global framework to improve the applications performance under various practical. The proposed global framework is designed with network of communication systems, in which the communication has to be fast enough and lossless. The virtualization of the network allows for low computational complexity and improved processing efficiency.

The twelfth paper entitled "PO-PBL: Project Oriented Problem Based Learning for Wireless Sensor Networks". this paper proposes and implements a hybrid pedagogy called Project Oriented Problem Based Learning (PO-PBL) which is time effective and result oriented learning pedagogy. It has resulted in providing impetus to R&D in WSNs. Further the proposed pedagogy is divided into two paradigms namely PO-PBL Macro Model and PO{PBL Micro Model.

The thirteenth paper entitled "Proposed Inductor Design for High Speed Digital Communication Systems through Divergence Analysis of Self Inductance to determine the variability in the permeability Values of unaltered Human Hair". This paper presents theoretical model for the air and iron core solenoid to calculate and reaffirm the permeability values of the human hair especially for South Asian ethnic region.

The fourteenth paper entitled "Vital Signs Monitoring System (VSMS) using Wireless Sensor Networks". This paper proposed an energy efficient vital sign monitoring system using WSN. The power of WSN nodes which is the very important issue in WSN is minimize using the genetic algorithm.

The fifteenth paper entitled "Addable Stress Speech Recognition with Multiplexing HMM and Non-Training Decision". In stress speech recognition, a recognition model that is capable of processing multi-stress speech needs to be designed in the view points of accuracy and add-ability. This paper proposes addable stress speech recognition with multiplexing HMM (Hidden- Markov Model). The results showed that the proposed method achieved 94.7 % recognition rate comparing to 94.2 % of the training-based decision method.

The sixteenth paper entitled "Deployment of Cognitive Radio in India". This paper gives an overview about what initiatives should be taken by the regulator to introduce cognitive radio in India. It concludes that UHF band (300 MHz–3 GHz) is good candidate for cognitive radio system.

The seventeenth paper entitled "Web Support System for Business Intelligence in Small and Medium Enterprises". This research proposes a Web Support System for Business Intelligence (WSSBI) which provides automated data mapping and loading from user application to BI framework and also validates it. The system also assists users in getting the outputs in terms of reports and dashboards. The implementation of the proposed framework demonstrates convenience of use and effective cost saving as it does not require any technical expertise.

The eighteenth paper entitled "Spectrum Sensing in relation to Distributed Antenna System for Coverage Predictions". In this paper it is shown how an Outdoor Distributed Antenna System Network can become a boon for future technologies that need radiating sites at a low inter-site distance, by having a sensing capability at its nodes. An operational service provider is chosen for research purpose and improvements by implementing suggestions are presented.

The nineteenth paper entitled "Mobile DDR IO Standard Based High Performance Energy Efficient Portable ALU Design on FPGA". In this work, energy efficient ALU using the most energy efficient LVCMOS IO standard for the highest frequency of i7 processor is proposed. It is observed that LVCMOS12 is the most energy efficient than all available LVCMOS having 26.23, 58.37 and 75.65 % less IO power reduction than LVCMOS18, LVCMOS25 and LVCMOS33 respectively at 1 GHz.

The twentieth paper entitled "Wireless Body Area Sensor Network Authentication using Voronoi Diagram (VD) of Retinal Vascular Pattern ". This paper focuses on the problem of human authentication in Body Area Sensor Network (BASN) using retina. The approach presented in this paper rejects any non-similar retina instantly while maintaining excellent accuracy and performance.

The twenty first paper entitled "A Group based Replication Mechanism to Reduce the Wastage of Processing Cycles in Volunteer Computing". The proposed grouping mechanism is based on collective impact for CPU and RAM, spot-checking and task completion history that categorize the hosts in Platinum, Gold and Silver groups. Relevant replication mechanisms are proposed for individual groups.

The twenty second paper entitled "Problem-Based Learning Framework for Junior Software Developer: Empirical Study for Computer Programming Students". This study represents teaching processes applied Problem-Based Learning (PBL) technique, both learning directions and communications between lecturer and student. Freshmen of Computer Programming subject, School of Information Technology (IT), Mae FahLuang University are a target group of this empirical study.

The twenty third paper entitled "PBL Framework with Industrial Participation for Improving Software Design and Development Skills". This study investigates a Problem based learning framework (PBL) which focuses on how to improve the software design and development skills, in collaboration with the industrial firms.

The twenty fourth paper entitled "Ubiquitous Learning Environment: Smart Learning Platform with Multi-Agent Architecture". This paper aims to develop the Ubiquitous Learning Environment (ULE) being able to provide the content to the learners appropriately and adaptively. The developed ULE consists of several Leaning Objects (LOs) having the multi-agent architecture to achieve adaptability.

The twenty fifth paper entitled "Fast Steering Mirror Control using Embedded Self-learning Fuzzy Controller for Free Space Optical Communication". This paper presents architecture for laser beam acquisition, tracking and pointing mechanism. The centroid of the received image beam is calculated and then error is computed using reference position.

Coordinating Guest Editor: Bhawani Shankar Chowdhry,
Guest Editors: Javier Poncela, Rajendrakumar Giridharilal Tated,
Sandeep Inamdar, Romyen Kosaikanont

**Bhawani Shankar Chowdhry**  is the Dean Faculty of Electrical, Electronics, Telecommunication and Computer Engineering at Mehran University of Engineering and Technology, Jamshoro (MUET), Pakistan. He did his B.E. in 1983 from MUETand Ph.D. in 1990 from School of ECS, University of Southampton, UK. He has more than 30 years of teaching, research and administrative experience in the field of Information and Communication Technology. He has the honour of becoming one of the editor of books "Wireless Networks, Information Processing and Systems", CCIS 20, and "Emerging Trends and Applications in Information Communication Technologies", CCIS 281, and "Wireless Sensor Networks for Developing Countries", CCIS 366, published by Springer Verlag, Germany. 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, Ireland, 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), Senior Member ACM Inc. (USA).

**Javier Poncela** 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) on formal modeling and system testing in Bluetooth, UMTS and satellite systems. His actual research interests include methodologies for efficient development of complex communications systems, analysis of end-to-end QoS over heterogeneous networks and systems and models for the evaluation of QoE.

**Rajendrakumar Giridharilal Tated** is currently working as a Director of Shreeyash Institute of Engineering and Technology, Aurangabad. Maharashtra, India. He did his Bachelor of Mechanical Engineering, Masters in Production and Ph.D. in Mechanical Engineering. He has 25 years of teaching experience out of which last nine years he has headed three institutions and had a key role to develop the same. He was Principal, Sandip Institute of Engineering and Management during the period of TTPBL 2013. He was a member of Board of studies in Mechanical Engineering, Faculty of Engineering and Technology, Academic Council, Management Council, Standing Committee, Earn and Learn scheme, Chaiman of Adhoc Board in Prouction Engineering and B.Tech. of Dr Babasaheb Ambedkar Maratwada University, Aurangabad, Maharashtra, India. He has to his credit more than 25 publications in national and international conferences/journals. He has authored a book titled "Elements of Mechanical Engineering".He is a life member of ISTE, IEI (India).

**Prof Dr. Sandeep Inamdar** is bachelor in Electrical Engineering and completed Masters Degree in control systems. He completed his Doctoral programme from NITIE in Electrical Distribution System Efficiency Improvement. He is currently secretary of Vishwa-Niketan, co director, CTIF India, trustee, GISFI (www.gisfi.org.in) and was Director/Principal of various Engineering colleges/campuses in India for more than 20 years. He has been expert committee member of universities, State Govt's, Department of Science and Technology (NCSTC Division) on different Portfolios. He has participated in two European Commission Projects so far and is currently contributing as Steering Committee Member of Erasmus Mundus program of European Commission titled "Mobility for Life". He is a recognized Ph.D. guide in project based learning with UNESCO chair in Aalborg University Denmark. He has travelled across the globe and has collaborative programs with few well known universities in the world. He has organized more than 25 International Workshops and conferences. He is deeply interested in Problem Based Learning activities involving user industry and evolved more than 15 skill development programs for students in India. He is currently involved into creating 'Vishwaniketan' near Navi Mumbai, which will an institution dedicated for product development Research and project based learning. In personal capacity, he is developing a self sufficient home for 50 children who have lost their parents on a self owned 10 acres land near Navi Mumbai.

**Romyen Kosaikanont** is an Assistant to the President of Mae FahLuang University and also a lecturer in Economics, School of Management. By training, she is a feminist economist and received her Master Degree in Gender and Development from Institute of Development Studies, University of Sussex and Ph.D. in Economics and International Development, University of Bath, UK. Her main research interests and community engagement works are on Gender and Urban Environmental Management in South East Asia (funded by CIDA-AIT), Participatory Urban Community Development (Thai Foundation), and Informal Female Workers Rights (OXFAM SADA). Her recent action research is on Community Archeology employing participatory approach in conducting archeological and historical research in Mae Hong Son Province.