Editorial Preface

Debashis Saha,
Indian Institute of Management Calcutta, India

Varadharajan Sridhar,
Sasken Communication Technologies, India

Welcome to the third issue of IJBDCN of 2012. When this issue reaches you, the high speed 4G Long Term Evolution (LTE) networks are fast being deployed by mobile operators around the world. About 96 operators in 46 countries have already completed deployment of LTE networks, while commitment is there from 347 operators in about 104 countries to join the bandwagon in near future. As the network speed and spectral efficiency are increasing, data rate on these networks are also increasing rapidly. Analysts expect that mobile data download may touch the all-time high of about 1.2 Exabytes/month by this year, thanks to ultra Smartphones and associated applications that are being launched one after another throughout the world.

One of the emerging areas that will definitely and should use advanced communication services is healthcare. Mobility can improve quality of life considerably through various facets ranging from providing the care-givers access to Electronic Health Records (EHR) systems to enabling more accurate drug administering and patient tracking. However, ensuring security and privacy of EHR is of paramount importance to healthcare organizations and governments. Real-time tele-health solution that addresses the critical healthcare needs of populations that do not have direct and timely access to medical care are being experimented in a number of places of the developing nations. Cloud computing and social networking are being contemplated to enhance the provisioning of healthcare services.

In this issue, we are pleased to include two research essays that address advances in healthcare system enabled by communication technologies. We are sure that you will find these essays very useful as references for your research work. Apart from these research essays, this issue also contains two research papers that address important areas in business data communications.

The gap between supply of network capacity vis-à-vis data demand, have often resulted in many advancements in technologies, market place and regulations. Mobile operators are often found wanting for capacity and resorted to myriad of techniques to smoothen the demand – some of which are actively opposed by the Net Neutrality proponents. Radio resource management is always a key challenge faced by cellular network operators. The first research paper by Sadhukhan and Mandal looks at the problem of dual-homing of Radio Network Controllers (RNCs) to Serving GPRS Support Node (SGSN) or Message Switching Centres (MSCs) to improve Quality of Experience of users in Universal Mobile Telecommunication Services (UMTS) networks. The problem, in which some specific RNCs are connected to two MSCs/SGSNs via direct links results in a complex many-to-two mapping structure in parts of the network. To solve this NP-Complete problem, they attempt partial dual-homing

to increase link cost minimally and reduce handoff cost maximally, thereby significantly reducing the total cost in a post-deployment optimal extension of UMTS cellular networks. They formulate the scenario as a combinatorial optimization problem and solve it using three meta-heuristic techniques, namely Simulated Annealing (SA), Tabu search (TS) and Ant colony optimization (ACO). They next compare these techniques with a novel optimal heuristic search method that they have propose typically to solve the problem. The comparative results reveal that, though all of them perform equally well for small networks, for larger networks, the search-based method is more efficient than meta-heuristic based techniques in finding optimal solutions quickly.

The second research paper by Dhraief, Mahjri, and Belghith is titled "A Performance Evaluation of the Coverage Configuration Protocol Under Location Errors, Irregular Sensing Patterns and Noisy Channel." Area coverage is a fundamental measure of quality of service in sensor networks because it indicates how well each point in the sensing field is monitored by the sensors. Location errors, sensing irregularity and packet losses are common and non-negligible phenomena in wireless sensor systems. Thus, there is an urgent need to evaluate the effect of these phenomena on the performance of the area coverage protocols. In this paper, the authors first propose to study the robustness of coverage configuration protocol (CCP) against location inaccuracy, sensing irregularity and packet losses. Then, they focus on the applicability of CCP on a real use case, namely precision agriculture. In precision agriculture, farmers and agribusinesses target to micromanage their fields by applying an efficient and localized soil/plants chemical treatment. The farmers need to cover the entire field with sensors in order to precisely and rapidly localize the area where the chemicals should be dispersed. In this paper, the authors target to study to what extent famers and agribusinesses can rely on CCP to achieve precision agriculture goals.

Third, we present a contemporary research essay by Al-Kadi and Chatterjee that explores the use of social networks and associated crowd sourcing techniques to launch Health 2.0, the new phenomenon in providing healthcare services. They discuss how online social networks can help achieve various goals of healthcare services such as improving patient care and providing enhanced services, and most importantly increasing and simplifying knowledge sharing amongst the beneficiaries. In this essay, they provide evaluation of some of the social online networks using a framework that comprises variables such as information accuracy and quality, information presentation, information literacy, and information privacy & confidentiality. Readers will certainly find many pointers to further research issues after reading this informative as well as interesting essay.

Fourth is the research essay by Khansa et al. on intelligent cloud-based EHR system that has the potential to reduce medical errors and improve patients' quality of life, in addition to reducing costs and increasing the productivity of healthcare entities. The authors present a framework consisting of end user policies, privacy and confidentiality of health information, and "Big data" mining capabilities that could streamline access to private patient information and compliant with related healthcare regulations and policies.

We hope that you enjoy reading this issue as much as you have enjoyed the previous issues of the IJBDCN.

Debashis Saha
Varadharajan Sridhar
IJBDCN
Editors-in-Chief

Debashis Saha is a full professor with the MIS Group, Indian Institute of Management (IIM)-Calcutta. Previously, he was assistant and then associate professor with the CSE Department at Jadavpur University (Kolkata, India). He received his BE (Hons) degree from Jadavpur University (Kolkata, India), and the MTech and PhD degrees from the Indian Institute of Technology (IIT-Kharagpur, India) all in electronics and telecommunications engineering. His research interests include telecom network design and analysis, pervasive communication and computing, network operations and management, wireless networking and mobile computing, ICT for development, and network economics. He has supervised thirteen doctoral theses, several master's theses, published about 280 research papers in various conferences and journals, couple of case studies, and directed 4 funded research projects on networking. He has co-authored several book chapters, a monograph, and five books including Networking Infrastructure for Pervasive Computing: Enabling Technologies and Systems *(Norwell, MA: Kluwer, 2002) and* Location Management and Routing in Mobile Wireless Networks *(Boston, MA: Artech House, 2003). Dr. Saha is the recipient of the prestigious career award for Young Teachers from AICTE, Government of India, and is a SERC Visiting Fellow with the Department of Science and Technology (DST), Government of India. He is a Fellow of West Bengal Academy of Science and Technology (WAST), Senior Life Member of Computer Society of India (CSI), Senior Member of IEEE, member of ACM, member of AIS, and member of the International Federation of Information Processing Working Group's 6.8 and 6.10. He was the founding Chair of Calcutta Chapter of IEEE Communications Society (2003-2008).*

Varadharajan Sridhar is a Research Fellow at Sasken Communication Technologies (Bangalore, India). He received his BE (Hons) from the University of Madras (India), Post Graduate Diploma in industrial engineering from the National Institute for Training in Industrial Engineering (Mumbai, India), and PhD in MIS from the University of Iowa (USA). He had taught at Ohio University and American University in the U.S.; at the Management Development Institute (India) and Indian Institute of Management (Lucknow, India). He was a visiting Professor at the University of Auckland, New Zealand and at Aalto University, Finland. Dr. Sridhar's primary research interests are in the area of telecommunication management and policy and global software development. He has published many research articles, business cases, and chapters in edited books in his area of research. His latest book titled The Telecom Revolution in India: Technology, Regulation and Policy *has been published by the Oxford University Press India. Dr. Sridhar is a member of various committees relating to telecommunications and IT set up by the Indian government. He is on the editorial board of the* Journal of Global Information Management *and is a member of ACM and AIS.*