Editorial: Special Issue on “Cooperation Optimized Innovation Intelligent Infrastructure Networks (COINS)”

Selected Topics from the Strategic Workshop, May 14–16, 2014, Skørping, Denmark

Ramjee Prasad · Marina Ruggieri

Published online: 21 March 2015
© Springer Science+Business Media New York 2015

The 16th Edition of the closed-door Strategic Workshop was held in Skørping, Denmark from the 14th to the 16th of May, 2014. The focus during the active 2-day discussions of the participating major stakeholders was on COINS, addressing network architecture, technologies, convergence beyond the last mile, and network management.

The theme for the Strategic Workshop 2014 (SW'14) was Cooperation Optimized innovation Intelligent Infrastructure Networks (COINS): 5G research initiative that supports the revolution by introducing Cooperative Intelligent Transport Systems (C-ITS), aiming to provide innovative Over-The-Top Services (OTTS) based on Intelligent Infrastructure networks.

COINS concept addresses ubiquitous Smart City, using ICT to make its infrastructure, public services and components efficient, interactive and citizens more aware. The key challenge is how to create game-changing opportunities and transform usual ICT business cases to societal value cases maintaining the self-sustainability and self-management of the infrastructures.

This Special Issue features nine selected papers on the above topic that concentrate on a wide range of problems in the way 5G will revolve including security, trust and privacy, Quality of Experience (QoE), Smart City, Internet of Things (IoT), sensor networks, smart machine networks, cooperative networks, challenges and business model.

The first paper, “*5G Revolution Through WISDOM*”, by Ramjee Prasad proposes and introduces a novel concept Wireless Innovative System for Dynamically Operating Mega Communications (WISDOM) responding to the needs of connected society of 2020 and beyond.

R. Prasad (✉)
Center for TeleInfrastruktur (CTIF), Aalborg University, Aalborg, Denmark
e-mail: Prasad@es.aau.dk

M. Ruggieri
Telecommunications Engineering, University of Roma “Tor Vergata”, Rome, Italy
e-mail: Ruggieri@uniroma2.it

The second paper, “*Multi-Metrics Approach for Security, Privacy and Dependability in Embedded Systems*”, by Iñaki Garitano, Seraj Fayyad, and Josef Noll provides a methodology together with a Multi-Metrics approach to evaluate the system Security, Privacy and Dependability (SPD) level during both the design and running processes.

The third paper, “*Network Performance Testing System Integrating Models for Automatic QoE Evaluation of Popular Services: YouTube and Facebook*”, by Francisco Lozano, Gerardo Gómez, Mari Carmen Aguayo-Torres, Carlos Cárdenas, Antonio Plaza, Antonio Garrido, Janie Baños-Polgase, and Javier Poncela presents a novel QoE system that can automatically capture and process the metrics needed to evaluate two commonly used applications, the social networking application Facebook and the video download application You Tube.

The fourth paper, “*Deploying 5G-technologies in Smart City and Smart Home Wireless Sensor Networks with Interferences*”, P. Lynggaard and K. E. Skouby discusses some of the key challenges that exist in the smart city and smart home networks in the light of possible 5G solutions.

The fifth paper, “*Sensor Function Virtualization to Support Distributed Intelligence in the Internet of Things*”, by Floris Van den Abeele, Jeroen Hoebeke, Girum Ketema Teklemariam, Ingrid Moerman, and Piet Demeester is divided into two parts. The first part motivates the need for distributed intelligence based on shortcomings in typical IoT systems. The second part focuses on the concept of Sensor Function Virtualization, at potential enabler for distributed intelligence, and presents solutions on how to realize it.

The sixth paper, “*Deployment of Sensor Networks in Crop Storages*”, by Jakob Pilegaard Juul, Ole Green, and Rune Hylsberg Jacobsen describes the challenges of providing a good network coverage, sufficient network lifetime, a physical design able to cope with the harsh environments met in deployments, and cost.

The seventh paper, “*Service Knowledge Discovery in Smart Machine Networks*”, by Yunus Durmus, and Ertan Onur proposes the Smart Discovery Protocol (SDP) which outperforms the operational service discovery protocols with three main features: more expressive semantic representation for the services, operating in the network layer to deal with diversity, and unifying existing service discovery protocols.

The eighth paper, “*Throughput in a Cooperative Network and Channel State Information*”, by Yi-Nung Yeh and Kwang-Cheng Chen provides the exact throughput of practical cooperative ad hoc network, in which users make autonomous decisions with regard to their network usage based on the current network conditions and their individual preferences.

The ninth paper, “*The Opportunities and Challenges of Persuasive Technology in Creating Sustainable Innovation and Business Model Innovation*”, by Annabeth Aagard and Peter Lindgren explores knowledge of the stakeholders and their behaviour as well as the potentials in actively supporting more sustainable behaviours provides totally new and unique opportunities for radical and customer-focused sustainable innovation and business model innovation through a theoretical review and case examples.

Ramjee Prasad is currently the Director of the Center for TeleInFrastruktur (CTIF) at Aalborg University, Denmark and Professor, Wireless Information Multimedia Communication Chair. Ramjee Prasad is the Founder Chairman of the Global ICT Standardisation Forum for India (GISFI: www.gisfi.org) established in 2009. GISFI has the purpose of increasing of the collaboration between European, Indian, Japanese, North-American and other worldwide standardization activities in the area of Information and Communication Technology (ICT) and related application areas. He was the Founder Chairman of the HERMES Partnership—a network of leading independent European research centres established in 1997, of which he is now the Honorary Chair. He is a Fellow of the Institute of Electrical and Electronic Engineers (IEEE), USA, the Institution of Electronics and Telecommunications Engineers (IETE), India, the Institution of Engineering and Technology (IET), UK, Wireless World Research Forum (WWRF) and a member of the Netherlands Elec-

tronics and Radio Society (NERG), and the Danish Engineering Society (IDA). He is also a Knight (“Ridder”) of the Order of Dannebrog (2010), a distinguished award by the Queen of Denmark. He has received several international award, the latest being 2014 IEEE AESS Outstanding Organizational Leadership Award for: “*Organizational Leadership in developing and globalizing the CTIF (Center for TeleInFrastruktur) Research Network*”. He is the founding editor-in-chief of the Springer International Journal on Wireless Personal Communications. He is a member of the editorial board of other renowned international journals including those of River Publishers. Ramjee Prasad is a member of the Steering committees of many renowned annual international conferences, e.g., Wireless Personal Multimedia Communications Symposium (WPMC); Wireless VITAE and Global Wireless Summit (GWS). He has published more than 30 books, 900 plus journals and conferences publications, more than 15 patents, a sizeable amount of graduated PhD students (over 90) and an even larger number of graduated M.Sc. students (over 200). Several of his students are today worldwide telecommunication leaders themselves.

Marina Ruggieri is Full Professor in Telecommunications Engineering at the University of Roma “Tor Vergata” (Italy) and therein member of the Board of Directors. She is Steering Board Chair of CTIF, an Interdisciplinary Research Center on ICT, that belongs to an international network with nodes in Europe, Asia and USA. She is proboviro of the Italian Industries Federation for Aerospace, Defence and Security; member of the Technical-Scientific Committee of the Centre for Aeronautical Military Studies; Vice President of AFCEA Rome Chapter. She is the Principal Investigator of the 40/50 GHz Communications Experiment onboard the Alphasat satellite, launched in 2013. She is IEEE Division IX Director; Sr. Past President of the IEEE Aerospace and Electronic Systems Society; Member of the IEEE Fellow Committee, Award Committee, and Governance Committee. She received: 1990 Piero Fanti International Prize; 2009 Pisa Donna Award as women in engineering; 2013 Excellent Women in Roma Award; Excellent and Best Paper Awards at international conferences.

She is IEEE Fellow. She authored 320 papers, 1 patent and 12 books.