Editorial

Hassnaa Moustafa

France Telecom R&D (Orange Labs),
Issy les Moulineaux, France
E-mail: Hassnaa.moustafa@orange-ftgroup.com

Maria Calderon and Carlos J. Bernardos

Universidad Carlos III de Madrid,
Leganes, Madrid, Spain
E-mail: maria@it.uc3m.es
E-mail: cjbc@it.uc3m.es

Biographical notes: Hassnaa Moustafa received the Master of Science Degree in Parallel and Distributed Systems from the University of Paris XI in 2001 and the PhD Degree in Computer and Networks from Telecom ParisTech in 2004. Since January 2005, she is working as a senior research engineer at France Telecom R&D (Orange Labs) and manages a number of research projects. She edited a book on vehicular networks and co-authored a wide number of book chapters with CRC Press. She chaired the WEEDEV 2009 workshop and served as a TPC member and a TPC chair for a wide number of international conferences.

Maria Calderon received a Computer Science Engineering Degree in 1991 and a PhD Degree in Computer Science in 1996, both from the Technical University of Madrid (UPM), Spain. She is an Associate Professor in the Telematics Engineering Department of UC3M. She has published over 25 papers in outstanding magazines and conferences in the fields of advanced communications, reliable multicast protocols, programmable networks, network mobility, and IPv6 mobility. Some of the recent European research projects in which she has participated are E-NEXT, LONG, GCAP, DAIDALOS, and GEONET.

Carlos J. Bernardos received a Telecommunication Engineering Degree in 2003, and a PhD in Telematics in 2006, both from the University Carlos III of Madrid (UC3M), where he worked as a research and teaching assistant from 2003 to 2008. Since then he has worked as Associate Professor at UC3M. His PhD thesis focused on Route Optimisation for Mobile Networks in IPv6 Heterogeneous Environments. His current work focuses on vehicular networks and IP-based mobile communication protocols. He has served as TPC chair of WEEDEV 2009. He also served as guest editor of IEEE Network.

Vehicular Networks are attracting significant interest in both academia and industry, driven by road safety requirements and intelligent traffic control. Vehicular Networks form a novel class of wireless networks and are spontaneously formed between moving vehicles equipped with wireless interfaces of similar or different technologies. Vehicular Networks are promising in enabling vehicle-to-vehicle and vehicle-to-infrastructure communications, having significantly different characteristics compared to other wireless and mobile networks especially concerning high speed and unpredictable topology, and present a very active field of research, development, standardisation, and field trials.

Vehicular networks technology is entering a critical phase where academia, industry and governments worldwide are investing significant time and resources on the large-scale deployment of these networks so that its benefits in the road safety and improvement of traffic flow could be leveraged. In this context, many national and international projects in government, industry, and academia are devoted to vehicular networks. These include consortia like Vehicle Safety Consortium (VSC) in the USA, the Car-2-Car Communication Consortium (C2C-CC) and the ETSI-ITS in Europe, the Advanced Safety Vehicle Program (ASV) in Japan, and other standardisation efforts like IEEE 802.11p (WAVE), and field trials like the large-scale Vehicle Infrastructure Integration (VII) Program in the USA. Besides such efforts, there exists a proliferation of conferences and workshops on the topic of vehicular networks, treating technical, policy and economic challenges.

Although all those efforts, still a number of technical challenges need to be resolved in order that these networks could be widely deployed and used in our daily life. This motivates the need for real tests, field trials, and experimental evaluations for the different technological solutions and aspects in such networks. All such facts create a strong motivation to edit this special issue.

This special issue aims to present and discuss the recent advances and experimental evaluation in the development of vehicular networks and ITS application, and to disseminate the most advanced ideas and solutions in the field. Three of the published papers in this special issue are the extended versions of papers presented at the *2nd Workshop on Experimental Evaluation and Deployment Experiences on Vehicular networks (WEEDEV 2009)* http://www.weedev.org/2009/ that was held in conjunction with the *5th International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities (TRIDENTCOM 2009)*, on April 6–8th, 2009, in Washington DC, USA. http://tridentcom.org/tridentcom09/. Based on the WEEDEV 2009 outcome and on the need to deepen certain topics from a more focused perspective, WEEDEV 2009 has accepted the kind invitation of the *International Journal of Internet Protocol Technology* (IJIPT) to prepare a special issue. The authors of the selected papers were asked to produce extended and updated versions of their papers and to submit them to a selection process for publication in this Special Issue. The papers are presented according to the topics announced in the call for papers of this special issue and their titles are "Assessment of VANET multi-hop routing over an experimental platform", "Development of a VII-enabled prototype intersection collision warning system", "Density Based Clustering algorithm for Vehicular Ad-hoc Networks".

In the paper 'Density Based Clustering algorithm for Vehicular Ad-Hoc Networks', authors explored the topic of multi-criterion clustering algorithms for vehicular ad-hoc networks. The paper presents a multilevel clustering algorithm called Density Based Clustering (DBC) target to scenarios with high degree of mobility. The proposed algorithm forms stable and long living cluster using the density of the connection graph, the link quality and the road traffic conditions as metrics. DBC algorithm has been simulated using JiST/SWANS network simulator, combined with VanetMobiSim traces. Simulation experiments show that DBC exhibits higher stability than the popular Highest Id clustering algorithm.

In the paper 'Assessment of VANET multi-hop routing over an experimental platform', authors present a testbed for VANET evaluation, suited to carry out realistic performance experiments. The logs collected from the experiments may be post-processed to calculate several performance metrics at link, network and transport levels. The Optimised Link State Routing protocol (OLSR) has been evaluated over this platform, considering both urban and highway environments, and taking into account static and dynamic conditions. The results show the limitations of OLSR to efficiently update routing tables under stressful conditions.

In the paper 'Development of a VII-enabled prototype intersection collision warning system', the authors introduce the design of a prototype intersection collision warning system based on VII. They have designed a system consisting of roadside and on-board units, in which appropriate alarm messages are disseminated by the roadside unit in case it predicts a potential collision at the intersection to notify endangered vehicles of the moving car which is about to cross the red light. The proposed configuration has been implemented and tested in a real world scenario; the results are promising and the system has shown a negligible probability of false alarm.

We wish to thank all the authors for their great work and for considering the *International Journal of Internet Protocol Technology* for submitting their papers. We would also like to express our gratitude to Professor Sherali Zeadally the journal Editor in Chief for the support provided to us and the fruitful cooperation we had.

We hope that this special issue will represent a timely and significant reference for future researches in vehicular networks area.