Editorial

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Biographical notes: Abderrahim Benslimane is Full Professor of Computer-Science at the Avignon University/France. He has more than 150 refereed international publications. He is EiC of *Multimedia Intelligence and Security Journal*, Area Editor of *Wiley Security and Privacy Journal* and editorial member of *IEEE Wireless Communication Magazine* and *Elsevier Ad Hoc*. He serves as General-Chair of the IEEE WiMob since 2008; he lunched and serves as General-Chair of MoWNet, since 2011. He served as a Symposium co-chair/leader in many IEEE international conferences such as ICC, Globecom, AINA and VTC. He is Chair of the IEEE Communication Society TC of Communication and Information Security.

Thomas Kunz is a Full Professor of Systems and Computer Engineering at Carleton University, Ottawa, Canada. He heads the Mobile Computing Group, researching wireless network architectures, network protocols, and middleware layers for innovative wireless applications. He has served on more than 70 TPCs of international conferences and workshops in the mobile and wireless domain and has collaborated extensively with both industry and government research labs. He is the author or co-author of more than 250 technical papers and received a number of awards and best paper prizes. He is a senior member of both ACM and IEEE.

Kui Wu received the BSc and MSc in Computer Science from Wuhan University, China, in 1990 and 1993, respectively, and the PhD in computing science from University of Alberta, Edmonton, AB, Canada, in 2002. He joined the Department of Computer Science with the University of Victoria, Victoria, BC, Canada, in 2002, where he is currently a Full Professor. He was a Visiting Professor with Norwegian University of Science and Technology in 2008, a Fellow of the Japan Society for the Promotion of Science in 2009, and a Senior Research Fellow with City University of Hong Kong in 2009. His research interests include mobile and wireless networks, Internet of Things, and network performance evaluation.

This is a special issue on: "*Emerging Pervasive and Ubiquitous Networking*". It was dedicated mainly to the *Sixth IEEE International Conference on Selected Topics in Mobile & Wireless Networking (MoWNet'17)*, Avignon, France. However, open submissions were highly welcome and encouraged. The achievement of this special issue would not have been possible without the excellent work of the guest editors. 60 papers were submitted. After two rounds of the review process, we decided to accept only 12 papers. Each paper received at least THREE useful

reviews. We would like to thank all reviewers for their strong help and quality of their comments to allow authors to improve their papers.

In their paper 'Internet of things: a research-oriented introductory', the authors survey the developing research landscape with regard to the internet of things (IoT), discussing IoT architectures, elements, protocols, and applications. Particular emphasis is placed on security, as in an IoT environment, a range of devices, sensors and actuators are connected together to collect data and exchange it with one other. Overall, this paper provides insights into the basics of the internet of things, and highlights research issues of relevance.

In 'Proficient communication between sensor devices using heuristic approaches in IoT environment', data collection in heterogeneous sensor networks, such as those expected in IoT environments, is studied. The system proposed by the authors gathers sensor data from heterogeneous mobile sensor nodes in an energy efficient and optimal way by properly using the constrained resources of the sensor nodes, namely energy, storage and limited transmission range. The base station releases a query, according to which clustering is done using particle swarm optimisation (PSO). Principle component analysis is used at a relay node to aggregate heterogeneous data of multiple dimensions. Ant colony optimisation (ACO) is used to forward data at every level by considering the energy of the node, distance from the base station and the velocity. Simulation comparisons with related approaches show that the proposed solution achieves higher packet delivery ratio, consumes less energy, and increases network lifetime.

'A novel group ownership proof and transfer scheme for B2B, B2C and C2C transactions' addresses the issue of the transfer of the ownership of RFID tags in the context of commercial transactions. The key contribution is an efficient and secure RFID ownership transfer scheme suitable for products with multiple components attached with tags that need to be shipped together as a group. The scheme allows an interested buyer to verify the ownership of products prior to purchase and ensures the privacy of both old and new owners. Compared to related work, the proposed scheme requires fewer transmission and a reduced computational load.

The authors of 'Adaptive sink mobility for energy-efficient data collection in grid-based wireless sensor networks' exploit the fact that sink mobility in wireless sensor networks (WSNs) has been shown to preserve the energy of the sensors for a longer network lifetime. These approaches require generally a logical organisation of the network within clusters, such as a grid. They propose an energy-based cell-head (CH) selection combined with a sink mobility algorithm to minimise energy consumption of sensor nodes and optimise data collection. Experimentation results confirm that the proposed solution offers better performance compared to existing approaches.

In 'Spider monkey optimisation based energy efficient clustering in heterogeneous underwater wireless sensor networks', the authors address the unique constraints of communication in underwater networks. The long propagation delays of acoustic transmissions argues for a reduced use of multi-hop routing, which would also result in a lower energy drainage of the nodes. A clustering approach based on spider monkey optimisation (SMO) is proposed and shown to enhance the average network lifetime of nodes and to achieve a significant reduction in average delay. The key benefit (compared to LEACH as representative related work) is that the proposed solution reduces the average hops between sender and receiver by 20%.

In their paper 'Optimal mobile beacon trajectories for nodes localisation in wireless sensor networks', the authors propose two novel optimal mobile beacon trajectories based on Hilbert curve: one with triangle method and the other with square method. The first proposal aims at minimising the trajectory length and improving the localisation accuracy, moreover, the second one minimises both the trajectory and the energy consumption. In this study, we compare the proposed techniques with mobile Hilbert beacon trajectory. Compared to the existing methods, these proposed methods improve the accuracy, the length of trajectories and the energy consumption.

The author of 'An intelligent routing protocol in VANET' proposed a new and intelligent routing protocol (IRP) using position based proactive message transmission in Vehicular ad hoc Networks environment. The proposed protocol aims to supply vehicles with live and quick information about the current links between road vehicles and hence better message routing, channel utilisation, error free, congestion free channel with less broken links using position based, multi-hop routing and best first search algorithm. Simulation results show that the proposed protocol achieves better performance, in term of packet delivery ratio and throughput and delay when compared with two other protocols.

To ensure collision avoidance in the presence of hidden nodes, the paper 'Time slotted channel hopping with collision avoidance' provides two intelligent algorithms (time slotted channel hopping with correct collision avoidance backoff algorithm (TSCH-CCA) and enhanced priority channel access backoff algorithm (E-PCA)) applied respectively to both normal packets and critical events packets. The proposed solution shows significant improvements in terms of latency, network congestion, network lifetime, critical event packets lifetime, and collision avoidance.

The paper 'An adaptive energy efficient flow coverage scheme for mobile crowd sensing in urban streets' deals with the problem of data collection process allowing to cover all segments in the street sides and select a minimal number of participants in each street segment preserve the mobile devices' energy and prolong the mobile crowd

sensing (MCS) network lifetime. To solve this problem, a flow coverage scheme is proposed to cover a specific street and achieve the sensing task requirements. The proposed scheme is based on using a modified localisation method that uses a minimal of GPS sensors and utilises the Zigbee technology to communicate with the neighbour nodes and estimate the distance between nodes by using the Time of Arrival method. Extensive simulations, based on the real movement traces of students at the university, have been accomplished. The results show the effectiveness and robustness of the proposed scheme compared to existing ones.

CoAP-based mobility management protocol (CoMP) exchanges Binding Update (BU) messages to manage location changes. However, these BU messages are subject to security vulnerabilities, such as denial of service (DoS), false BU, session hijacking, and man-in-the-middle (MITM) attacks. In the paper 'Security scheme for mobility management in the internet of things', the authors extend CoMP by proposing a security scheme based on a private key to protect the BU CoMP messages exchanged between the mobile nodes and clients, referred to as private key-based BU for CoMP (PKBU-CoMP). PKBU-CoMP ensures that mobile nodes check and confirm the address ownership and validity of mobile nodes before performing any BU operation. The performance of PKBU-CoMP was analysed both mathematically and using Cooja simulations.

The paper 'Smart vehicles for urban sensing based on content-centric approach' deals with the uploading of sensory content about urban streets by all vehicles to the infrastructure. The appropriate vehicles important for different urban sensing tasks are identified by measuring their relative importance in the network. First, the authors propose an algorithm named Content Rank where different location-aware content is autonomously ranked by a vehicle. It then uses a content importance and its mobility pattern to find its importance in the network. Based on the vehicle's centrality score the best content hubs in the network are identified to provide efficient collect, storage and exchange of sensory data based on content-centric networking (CCN). The random mobility of the consumer does not affect the data transmission. Geo-based routing process results in increased interest satisfaction rate.

In their paper 'CLPS: context-based location privacy scheme for VANETs', the authors propose a context-based location privacy scheme (CLPS) that makes the following contributions:

- a pseudonym changing strategy that permits to a vehicle to effectively change its pseudonyms based on its context
- a new linkability threat, called cheating attack, showing the vulnerability of the proposed pseudonym changing strategy to this attack.

To confront the cheating attack, the authors propose developing a cheating detection mechanism that allows a vehicle to detect misbehaving vehicles that are responsible for launching the cheating attack, and assess whether the change of pseudonym is successful after a pseudonym is changed.

Finally, we would like to thank the EiC for having accepted our special issue and for all his useful comment to success this SI. We would like also to thank the journal team for their reactiveness to deal with our requests.