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Editorial for this SI on
"Location Based Services and Applications in the era of Internet of Things"

The last decade of ICT has been characterized and driven in many aspects by the massive technological revolution of mobile devices that completely changed the way people communicate and how they interact with available services and the environment. Furthermore, the Internet of Things (IoT) represents the next technological (re)evolution envisioning a world where people and devices are always connected and can seamlessly interact with one another. In fact, people and things can more efficiently communicate on the move exploiting the awareness of their location (indoor and outdoor) while this information can also be used to create new context-aware services and experiences.

Smart City and Industrial IoT represent notable use cases where ubiquitous connectivity, mobility, and location awareness of people and devices represent key enablers to provide new services, ranging from dynamic creation of rescue groups in case of emergencies to efficient and autonomous management of warehouses. In particular, the advent of the IoT has pushed the development of innovative and widespread Location Based Services, by providing mechanisms to enable and foster the interaction (both monitoring and actuation) with the context surrounding people and things.

Based on these considerations and given the high interest and relevance of the topic, we have proposed the special issue on Location Based Services and Applications in the era of Internet of Things. The special issue is composed of 9 top-quality contributions, selected from a total of 36 high level and interesting submissions received that addressed a number of the identified topics.

The paper "Signal strength based scheme for following mobile IoT devices in dynamic environments", by Thomas Lagkas, George Eleftherakis, Konstantinos Dimopoulos, and Jie Zhang, introduces an algorithm to follow mobile monitored targets/individuals in the context of a dynamic IoT system. The devised Hot–Cold technique ensures proximity maintenance by tracking robotic devices solely based on the strength of the RF signal broadcasted by the target to communicate its sensors' data.

The paper "Generative Model based Attenuation Image Recovery for Device-free Localization with Radio Tomographic Imaging", by Zhongping Cao, Zhen Wang, Hanting Fei, Xuemei Guo, and Guoli Wang, explores the use of generative models in building an attenuation image to learn the inherent latent structure of the attenuation signal from the data itself rather than its prior knowledge. In particular, the proposed solution is applied on device-free localization with radio tomographic imaging.

The paper "A Deep Learning approach for Path Prediction in a Location-based IoT system", by Francesco Piccialli, Fabio Giampaolo, Giampaolo Casolla, Vincenzo Schiano Di Cola, and Kenli Li, faces the adoption of a Deep Learning methodology to data coming from a non-invasive

Bluetooth IoT monitoring system deployed inside a cultural space. The main goal is to predict the occupancy of the available rooms through the analysis of visitors' paths.

The paper "A scalable Edge Computing architecture enabling smart offloading for Location Based Services", by Dimitrios Spatharakis, Ioannis Dimolitsas, Dimitrios Dechouniotis, George Papathanail, Ioakeim Fotoglou, Panagiotis Papadimitriou, and Symeon Papavassiliou, presents a two-level Edge Computing architecture offering computing resources for the remote execution of a Location Based Service. A scaling mechanism simultaneously takes the offloading decision and allocates only the necessary resources based on the resource profiles and the estimation of a workload prediction technique.

The paper "Distributed load balancing for heterogeneous fog computing infrastructures in smart cities", by Roberto Beraldi, Claudia Canali, Riccardo Lancellotti, and Gabriele Proietti Mattia, address the problem of resources management by proposing two fully distributed load balancing algorithms providing a fair load sharing in highly heterogeneous scenarios with variable workload levels and high network delays that are typical characteristics of fog computing.

The paper "Mobile music recommendations for runners based on location and emotions: The DJ-Running system", by P. Álvarez, F.J. Zarazaga-Soria, and S. Baldassarri, presents a location based mobile application that interacts with a novel emotional wearable and a recommendation service that predicts the next song to be recommended. Predictions are performed by an intelligent system that combines artificial intelligent techniques with geodata and emotionally-annotated music.

The paper "Towards ensuring the reliability and dependability of vehicular crowd-sensing data in GPS-less location tracking", by Azzedine Boukerche, Burak Kantarci, and Cem Kaptan, presents a participatory framework to improve the reliability of sensor emulation by using non-dedicated and crowdsourced sensory data to cover several dedicated sensors in smart environments. The paper specifically considers as a potential use case GPS-less vehicle localization in a public transportation network.

The paper "edgeTrans - Edge transport mode detection", by Paulo Ferreira, Constantin Zavgorodnii, and Luís Veiga. edgeTrans exploits a machine learning algorithm to generate a model (i.e., a classifier) autonomously identifying the transport mode used by a user carrying her/his smartphone.

The paper "Transposition of Location-based Games: Using Procedural Content Generation to deploy balanced game maps to multiple locations", by Luís Fernando Maia, Windson Viana, and Fernando Trinta, uses Procedural Content Generation to transpose maps of location based games while focusing on maintaining the game balancing. The proposed solution maps location based games to a game model based on a directed weighted graph using information about Points-of-Interest around the players' location.

We would like to thank authors and reviewers, contributing the former with their original solutions and the latter with their improvement suggestions, together allowing us to present novel and interesting contributions in the field of Location Based Services applied to the IoT. We would also thank the EiC Prof. Sajal K. Das and the EiC for special contents Prof. Marco Conti for giving us the opportunity of organizing the special issue on the Elsevier's Pervasive and Mobile Computing journal.

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