

Guest Editorial Preface

Special Issue on Advances in Cloud for Smart Cities

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Smart Cities are transforming our urban life with digital technologies, offering new citizen-centric public services, optimizing the usage of resources and reducing the impact of service provisioning on the environment.

Generally, a smart city combines legacy networks and new communication architectures in order to achieve compatibility and interoperability among public administrations, operators, companies and population. Then, it goes beyond the use of ICT to provide new advanced services in diverse business and technological domains, such as urban transports, water supply, disposal facilities, lightning, heat buildings and so on. To this aim, the integration of information and communication systems, sensors and data analytics over different systems and infrastructures of a city is necessary.

Cloud computing has become the main technology for municipalities to move towards smart reality thanks to its high potential in terms of scalability and availability of resources. A Cloud is able to integrate different information and service management systems, providing an integrated information environment for all the activities of the city. With a cloud-based approach, several providers can leverage cloud resources to integrate sensing, processing or actuating infrastructures and to develop domain-specific applications. They can also implement cross-domain solutions, since the Cloud can easily enable collaboration and cooperation among different providers of smart facilities in a country.

The aim of this Special issue is to present innovative Cloud solutions for smart cities, able to integrate monitors and sensors, storage devices, analytics, tools and virtualization platforms. This Special issue includes three new papers and also two extended, thoroughly revised papers presented at the Workshop on CLOUD for IoT (CLIoT 2015) and Workshop on the Intelligent Exploration of Semantic Data (IESD 2013).

The papers included in this Special issue deal with several topics, focused on technologies, applications and services for smart cities. The first two papers are surveys on different research areas, whereas the last papers provide innovative solutions specifically aimed at smart cities purposes.

Sun et al. (1) provide an overview of current solutions on streaming remote sensing data processing, highlighting related challenges in the smart city domain. The paper discusses some design concerns for remote sensing data streaming processing systems, such as data model and transmission, system model, programming interfaces, storage management, and availability.

Wang et al. (2) present the current state-of-the-art in sensor data fusion. They analyze different sensor data fusion research efforts through an evaluation framework developed by the authors that comprises the ten most significant features related to sensor data processing in the IoT domain.

Belli et al. (3) address security aspects in a novel Cloud architecture for Big Stream applications, which efficiently handles Big Stream data through a Graph-based platform and delivers processed data to consumers, with low latency. In the platform, data streams can be shared among several actors (e.g., IoT data-sources, developers or consumers), composing and aggregating different data streams in order to build useful services for Smart Cities.

Kantarci et al. (4) propose a new crowdsensing framework, namely Social Network Assisted Trustworthiness Assurance (SONATA), which aims at maximizing crowdsensing platform utility and minimizing the manipulation probability through vote-based trustworthiness analysis in dynamic social network architecture. Then, they present performance evaluation of SONATA under various crowdsensing scenarios in a smart city setting.

Thakker et al. (5) developed a linked data browser that provides an interface for user browsing through several datasets linked via domain ontologies. Their paper presents a systematic user study that provides an insight on central issues related to exploratory search and browsing through linked data to support smart city goals.

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