Imminent Communication Technologies for Smart Communities

Editorial for Part 2

While walking on the streets, we can identify hundreds of devices connected to the network in many ways, and this is not the end. As per many recent statistics and predictions, we will have billions of devices connected to the Internet and we will be able to reshape the entire living standards and styles of cities through such connectivity. In such a connected environment, one can easily expect a large amount of data to be generated, collected, and analyzed to provide a variety of services, including smart logistics, health care, agricultural reforming, and Smart Grid, with an ultimate goal of improving the consumer's experience. Collectively, we name these services as a step toward Smart Communities, and in this Feature Topic we present six papers proposing very interesting solutions and architectures for the futuristic smarter communities and cities.

The first article, entitled "Privacy-Preserving and Efficient Aggregation Based on Blockchain for Power Grid Communications in Smart Communities," presents an interesting idea to protect users' ID using Blockchain structures. The rationale behind this work is to preserve privacy and provide robust data aggregation in Smart Grid communications. Further, the authors evaluated their proposed scheme vs. state of the art solutions available in the literature. This work opens a new set of discussions regarding how Blockchain is transforming applications contributing toward smarter communities.

The second article "Toward Energy and Resource Efficient Internet of Things: A Design Principle Combining Computation, Communications, and Protocols," presents a very informative tutorial regarding sensory edge computing potentials. As we know that sensors are the major part of the IoT family and thus contribute a lot toward smart communities, this article opens a new direction of research. We expect community to understand the complexity involved in bringing energy efficiency and real-time computation power to IoT devices. This article is one of the first steps toward practical and reliable IoT battery operated devices. As proof of concept, the authors also evaluate their proposed ideas over 100 nodes using the RPL method and considering opportunistic networks.

The Internet of Things (IoT) devices are the vital element of any connected community and their applications are unlimited. However, the amount of data collected by such devices can be reasonably high and thus hard to keep it within the IoT devices, due to their heterogeneity in terms of lifetime, battery dependent, and mostly memory limitations. Thus, we include a third article entitled "sTube: An Architecture for IoT Communication Sharing," in which the authors propose a novel architecture for IoT communication with Clouds and propose an improve version of robustness in uploading. The authors also include initial results.

Like many other factors, the logistics of any community is a very important factor in determining resource distribu- tion, managing warehouses and industries, etc. Although we have recently seen Artificial Intelligence taking over many jobs to automate logistics operations, we still have a lot of room for improvement. The fourth article in this issue, entitled "Swarm Robotics Control and Communications: Imminent Challenges for Next Generation Smart Logistics," opens up the robotics based logistics discussion and pro- poses swarm robots-based solutions toward smarter logis- tics. Further, the authors also discuss a possible cohesion of AI and robotics for logistics applications. Future research challenges are also listed that will be very beneficial to the active community in this area.

Moving ahead, in the fifth article of this issue, entitled "Big Sensed Data: Evolution, Challenges, and a Progressive Framework," the authors highlight challenges to be faced due to the massive amount of data generated by these IoT devices. The authors provide a deep insight into the main technologies and their operational behaviors behind all these Big Data notions. This work also discusses the Big Sensed Data framework and proposes the architectural solution named as the "tri-plane approach" to accommodate the analytics of this Big Sensed Data. Those three planes include the resource plane, the data plane, and the information plane. The last article in this Feature Topic is titled "LocalFocus: A Big Data Service Platform for Local Communities and Smarter Cities." The authors in this work provide an open platform for large scale deployment of resources and their verification through an architecture named LocalFocus for testing Big Data analytics solutions on a real-time basis. Further, the authors present use cases for the research community to understand the functionality of this platform. Through this platform, we can have a solid idea of how big data analytics w ill bring a positive change to build futuristic smart cities as a part of smart communities.

We would like to express our sincere gratitude to all the contributing authors, the reviewers for providing constructive reviews, the IEEE Communications Society publications staff, in particular the Editor-in-Chief. To conclude, we believe that this Feature Topic on Smart Communities and Cities will open many research doors and roads to drive on for all active researchers including students, academicians, and industrial personnel.

Biographies

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