INTERNET OF THINGS AND SENSOR NETWORKS

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We celebrate the first appearance of the new Internet of Things and Sensor Networks Series as part of *IEEE Communications Magazine*! Today, the Internet of Things (IoT) is undergoing a fundamental transformation as an increasing diversity of intelligent equipment is being connected to it. Numerous radio-enabled devices are already integrated with the Internet by supporting the "network society" "like pigment in the wall paint". Computing is now expected to be available anytime and anywhere, at the reach of a button. Such a button can be anything from a smartphone, a portable or wearable device, or a miniaturized wireless sensor. Hence, this Series extends and supersedes the legacy Series on Ad Hoc and Sensor Networks toward the challenging future unveiled by the IoT vision.

In this vision, communication has to cope with a high demand in mobile data, to transfer more traffic among increasingly heterogeneous devices, in much more reliable and faster ways than before. The IoT is already supporting domains like smart health (e.g., IP addresses are being allocated for body organs, sensors are being swallowed like pills to measure the vital signs), smart energy or smart economy (e.g., factory equipment synchronizing internally and with suppliers and customers), smart households (with laundry machines starting up when electricity rates drop due to the time of the day or smart forks that warn when one eats too fast), smart cities (ATMs being able to recognize gunshots, parking spots knowing who has actually parked), and smart agriculture (devices already being used to track heads of cattle or monitor crops, soil acidity, etc.).

Underpinning this global development, this Series aims to bring together the latest academic and industrial research within the rapidly maturing IoT ecosystem. It is intended to profoundly explore the concept of IoT and sensor networks, highlight the recent research achievements therein, as well as provide insights into the theoretical and practical matters related to breakthroughs in this field from different perspectives. This inaugural issue outlines novel communication paradigms that contribute to the emergence of the pervasive computing vision based on the proliferation of sensor-rich portable devices. Up to now, such sensor-rich devices were mostly standalone. However, combined with or used complementary to an infrastructure-based computation substrate (e.g., the cloud), they leverage mobility and processing power of the end users to enhance their ability to sense, compute, and communicate even in the absence of reliable end-to-end connectivity.

In the first article, E. Markakis *et al.* present, in "Acceleration at the Edge for Supporting SMEs Security: The H2020 FORTIKA Paradigm," their first results in the EU-funded project named FORTIKA. The vision of the project is a cyber-security solution, a marketplace of cyber-security services that can be tailored and adjusted to the needs of SMEs. This solution integrates hardware and software with business needs and behavioral patterns over the existing network gateways to orientate business users to trusted cyber-security services. Users can further utilize a variety of services and share profiling information with the service providers for tailored security services aligned along their actual needs.

In the article "Blacklisting-Based Channel Hopping Approaches in Low-Power and Lossy Networks," V. Kotsiou *et al.* study different distributed and global blacklisting techniques to cope with radio transmissions prone to unreliability and external interference. Their analysis of the dependencies on the scheduling algorithm leads to the proposal of a new scheduling algorithm that is blacklist-aware, with results showing improvements in network reliability.

In the work "Task-Bundling-Based Incentive for Location-Dependent Mobile Crowdsourcing," Z. Wang *et al.* tackle the problem of unbalanced participation of people in commercial crowdsourcing applications. Such applications rely on the power of the crowd to collect — over the IoT technologies — massive data. The authors propose an incentive mechanism based on dynamic scheduling of task bundling. It is adapted to continuous sensing scenarios and popularity of tasks depending on participation in the previous round.

Finally, in "Intelligent and Energy-Efficient Data Prioritization in Green Smart Cities: Current Challenges and Future Directions," K. Muhammad *et al.* deliver a comprehensive analysis of the state-of-the-art and open research challenges in data prioritization (DP) techniques used to condense data being captured today and traditionally stored (and used in browsing, searching, and management) in large IoT data repositories. Based on the challenges and conclusions of their study, the authors then propose an energy-efficient DP framework that combines the IoT with techniques commonly used in artificial intelligence and big data analytics.

In brief, these articles provide a range of answers to questions related to the continuing evolution of the IoT field and the supporting networks, for different applications as well as various technologies used to address specific issues. We also thank all the reviewers and the editorial team for their hard work and invaluable support during the preparation of this issue.

BIOGRAPHIES

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