

Future of Wireless Access Technologies and Frameworks for Internet of Things (IoT) Applications

The advent of the Internet of Things (IoT) promises us a smart future. IoT applications' success depends on various factors, but without a reliable connection between the IoT entities (devices and sensors), its applications will not get off the ground. At present, wireless access technologies are undergoing a major generational shift. 5G and beyond networks underpin this technological transformation by enabling the industrial sector to utilise emerging technologies such as artificial intelligence (AI) and machine vision to provide massively improved visibility on all aspects of their business. With wireless access technologies, all of these devices can be seamlessly integrated into each other, offering an improved quality of services. However, wireless network connectivity is not about simply selecting the wireless network technologies. But it is most important to understand the requirements of the IoT application and then select the wireless access technologies that best fit the needs. In this special issue, we will briefly explore how IoT applications will progress around wireless access technologies and the need for new network technologies that will drive these changes.

While the IoT applications have sufficient access to the internet and other wireless technologies, the future looks different. The advances in IoT applications impose more advanced requirements to get connected to the internet, and the future of wireless technologies continue to improve as well. Hence it is essential to address the fundamental issues associated with radio spectrum, power, and transmission devices to empower speed, dependability, security, wide-area coverage, and ultra-low reliability communications for IoT applications. At the same time, with progress towards industry 4.0, it is expected that every vertical sector needs to share a common IoT platform and there come massive challenges in unifying these networks. This includes larger computational complexity and transmission latency in processing a huge volume of information and managing more terminals from the various IoT industrial sectors, which are not adequately addressed by the existing wireless communication standards. With these issues in consideration, it is crucial to envisage wireless access technologies and architectures for low-power, low-bandwidth IoT devices that require lightweight network communication protocols to manage the resource-constrained IoT devices effectively. Therefore seen from a much practical perspective, this special issue explores new innovative wireless access technologies and architectures for IoT applications from a vast array of solutions. We welcome researchers and practitioners from industry and academia to present their novel and innovative solutions.

Topics of interest include, but not limited to, the following:

- ❖ Fundamental trade-off reliable communication in IoT networks
- ❖ New wireless access technologies and frameworks for IoT applications with time-sensitive networks standards
- ❖ Advances in cognitive radio technology
- ❖ Advances in wireless network domain technologies for diverse IoT applications (cloud, virtualisation, and radio access networks)
- ❖ Intelligent software-based reconfigurable wireless networks for IoT applications

- ❖ Advances in MIMO technology and multi-antenna systems for reliable communication
- ❖ Ultra-wide band communication for IoT applications to attain high capacity and extreme low latency
- ❖ Initial and random-access protocols for reliable and real-time access
- ❖ Network automation and process automation technologies for IoT (wirelessHART, Wia-Fa, Wia-Pa)
- ❖ Device to device relaying for ultra-reliable low latency IoT communication
- ❖ Coordinated multi-point (CoMP) and distributed diversity techniques

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