

Waveform Design and Massive Connections for Beyond 5G Communications

Internet of things (IoT) will significantly change our lives and will have major influences in various spheres of activities such as 5G and Beyond 5G (B5G) communications, biomedical and healthcare; transportation; industry and manufacturing; agriculture; environmental monitoring; energy management; smart building; smart home; smart cities; smart wearables and many other intelligent applications. The number of connected devices, power consumption and signal coverage are three crucial factors that affect the performance of IoT devices where current technologies have made significant leaps over the past few years, yet, there still is much scope for improvement in B5G. With the increasingly rising demands from customers, the number of connected devices is expected to reach hundreds billions by 2030. Thus, the existing signal waveforms, network capacity planning and spectrum are not likely to meet the predicted growth. Data-driven services are going to boost and open new markets, but with the existing communication protocols and hardware, engineering challenges remain significant. Of such challenges, new power saving schemes, required to extend devices battery life, is a key one. Another is the use of artificial intelligence (AI) and its integration in all kinds of applications, together with the exploiting the benefits of machine learning/deep learning. A different set of challenges may relate to applications. Take for example the fast development of unmanned aerial vehicle (UAV) communications and applications for adaptive network configurations. Security in IoT is being paid more attention due to the limited hardware design and the expected ubiquity and utility of IoT based systems and networks. Blockchain technologies may allow the introduction of new methods not only to design future networks but also to operate them with additional and adaptive security promises. Healthcare is a joint technology and business IoT field, which inspires researchers to come up with novel biomedical circuit design and new business model. Smart-everything has motivated new challenges and research directions on the efficient use of IoT, which requires further exploitation. This special session aims to offer a platform for researchers to present new concepts and new research work and results on future waveforms and IoT technologies in Beyond 5G communications. Topics of interest include, but are not limited to:

- Signal waveform design (single-carrier and multi-carrier)
- Spectrally efficient wireless and optical systems design
- MIMO and multi-user MIMO systems
- Advanced modulation schemes
- Channel compensation algorithms
- Interference cancellation algorithms
- Robust precoding techniques
- Non-orthogonal multiple access
- Channel/frequency hopping design
- Spectrum sensing and sharing
- Communication protocol development
- Ambient backscatter communications
- Big data analytics in IoT
- Artificial intelligence in communications
- UAV communications
- Blockchain and security in IoT
- e-Health and biomedical hardware engineering
- Reliable and low latency connections in V2X
- Sustainable wireless networks
- Internet of satellites
- Internet of nano things
- Localization and positioning in IoT
- Hybrid Information and power transfer
- Business model in IoT
- Prototype and field trial

Important Dates

Paper Submission Deadline: 31st January 2019
Notification of Acceptance: 22nd February 2019
Camera-Ready Submission : 8th March 2019

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