Wireless Communications and Mobile Computing

Special Issue on
Achieving Sustainable 5G

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Due to the exponentially increased demands of mobile data traffic, for example, a 1000-fold increase in traffic demand from 4G to 5G, and the explosive growth in connected mobile devices, dramatic changes in the design of network architecture are required to meet the 5G requirements, and the opportunities and challenges of 5G rapidly gain great attention from academics, industries, and governments.

According to the trend in cellular networks evolution, 5G network will be a heterogeneous one consisting of macrocells along with a large number of small cells, device-to-device pairs, and machine type communication devices based communication tiers. Indeed, various promising technologies, which are essential for the operators to achieve a more efficient use of available radio resource and network infrastructure and to reduce both the capacity expenditure and operation expenditure in the network deployment and operations, have been proposed and investigated to achieve sustainable 5G and to accelerate the launch of 5G networks. The promising technologies include massive multiple-input multiple-output, new radio access, and new multiple access schemes. To avoid serious deficits of spectrum resource, there is an increased interest in the use of spectrum above 6 GHz and even mmWave frequencies for 5G communications.

Although the key-enabling technologies may significantly improve the 5G network performance, we also need to address some other challenges, such as interference management, mobility management, and channel estimation, in launching 5G networks, which are from deploying and operating the cellular networks to satisfy the unprecedented mobile device increase and the explosive traffic load growth with limited radio resources.

The purpose of this special issue is to provide readers with original research articles as well as review articles that present the-state-of-the-art research results and technologies enabling future sustainable and cost-efficient 5G networks.

Potential topics include but are not limited to the following:

- Sustainable and cost-efficient architectures of 5G
- Cloud radio access networks (RAN), fog and edge computing
- Cost-efficient issues in machine type communications
- Cost-efficient issues in ultra dense networks and massive access control
- Sustainable and cost-efficient radio resource management
- Novel multiple access techniques
- Other energy-efficient and spectral-efficient techniques

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