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Editorial: 5G Technologies for Future Wireless Networks

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Editorial:

With the rapid development of mobile Internet and smart phones, the data traffic of current mobile communication system increases exponentially. The opportunities and challenges of fifth-generation (5G) rapidly attracting high attention from all sectors of society. The demand for explosive data traffic in future mobile communication is expected to be met by using 5G technology. Many of the technologies that are important to 5G can provide high data rate services to meet future capacity requirements. With 5G's corresponding standardization and field deployment comes new challenges, such as the software defined wireless network architecture, big data and IoT in 5G,energy efficiency and spectral efficiency, interference mitigation and resource management and etc. In order to support 5G and future wireless networks, the aforementioned technologies need to be further researched.

This special issue features six selected papers with high quality. The first paper titled "Intelligent Technique for Seamless Vertical Handover in Vehicular Network" proposes an intelligent algorithm based on hybrid model which merges the biogeography-based optimization or BBO with the markov chain. This algorithm provides seamless mobility using the media independent handover, MIH (IEEE802.21), over heterogeneous networks with different access technologies. This method within the given scenario meets the requirements of the application as well as the preferences of the users.

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The second paper titled "Signal Ratio Detection and Approximate Performance Analysis for Ambient Backscatter Communication Systems with Multiple Receiving Antennas" formulate a new transmission model where the reader is equipped with at least two antennas and propose a ratio detector that exploits the ratios of the received signals strength at each antenna. Then, they proposed an antenna selection scheme if the reader is equipped with more than two antennas.

Vehicular networks play a pivotal role in intelligent transportation system (ITS) and smart city (SC) construction, especially with the coming of 5G.The third paper with the title "Big Data Aided Vehicular Network Feature Analysis and Mobility Models Design" proposed some novel vehicle and location collaborative mobility schemes relying on the GPS dataset and elaborates upon mobility design and graph analysis of vehicular networks.

In the next paper titled "Outage Performance for IDF Relaying Mobile Cooperative Networks", the authors study the transmit antenna selection (TAS) in mobile cooperative networks. They derived OP expressions, then they evaluated the impact of power allocation on OP performance and showed that the OP performance is affected by the power-allocation parameter.

Heterogeneous two-tier network with hybrid deployed small cells and macrocells is a promising solution for fifth generation (5G) wireless networks. The fifth paper, which is entitled "Optimization of Coverage in 5G Self-Organizing Small Cell Networks", proposed a self-organizing capacity and coverage optimization scheme using power adaptation to enhance the capacity and improve the coverage. Simulation results show that the proposed self-organizing scheme can effectively improve the capacity and coverage.

In order to improve the transmission bit rate and system performance, the last paper titled "User-relay Assignment based Antenna Selection Scheme in Multi-user Multi-relay AF Cooperative Communication Network" proposed a user-relay assignment based antenna selection scheme for multi-user cooperative network. The authors proposed a low complexity sub-optimal user-relay assignment algorithm. Then they present the antenna selection scheme to further enhance the system performance for the multi-user AF cooperative user-relay network,

after which three antenna selection criteria based on the maximum likelihood (ML) detection were proposed. Compared with the other schemes, the proposed schemes can effectively improve the average system sum rate, the outage probability of the worst user, and the system BER performance.

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