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## Editorial Wireless Caching Aided 5G Networks

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With the arrival of 5G mobile cellular networks and the proliferation of smart mobile devices, the wireless mobile data increase unprecedentedly, which will inevitably impose great pressure on the backhaul and degrade the QoE of mobile users. Edge computing or fog computing can provide enhanced service quality with increased network capacity and low latency, by utilizing elastic resources of edge or fog nodes, for example, computation, storage, and networking. Wireless caching, as an important technology for edge computing, has been attracting more and more focuses from both industry and academia. In caching-aided networks, popular data files can be proactively cached at the edge of mobile networks. These cached contents will be delivered to users directly from the edge of the networks. Meanwhile, the shift of wireless traffic from centrally generated voice service to locally created data also provides significant opportunities for caching, which is known as the trend of information-centric networks. In this special issue, we have invited a few papers to give insights on wireless caching aided 5G networks.

One paper of this special issue addresses an energyefficient caching problem based on shot noise model in backhaul-aware cellular networks, with both the cache hit rate and the optimal cache considered. A distributed caching policy is proposed to enhance the cache hit rate, and an optimization is formulated to analyze the tradeoff between energy efficiency and cache capacity. Another paper presents the performance analysis for Internet-of-things system under Nakagami channels, with both the direct link and the multihop relaying caching considered. Its main contribution is that the outage probability and bit error rate of the system are derived analytically without any approximation. Another paper investigates the energy efficiency in cacheenabled cellular networks with the limited backhaul, where the successful content delivery probability is calculated by the stochastic geometry method, and the analytical expressions of throughput, power consumption, and energy efficiency are derived as well for various cases.

Another paper of this special issue proposes a cooperative strategy to improve both the caching replacement and efficiency at wireless edges in IP-based networks. User's QoE is introduced to estimate the caching efficiency, and various caching allocation methods are adopted for better user's quality of experience. Another paper analyzes the system performance of a two-hop decode-and-forward relaying network without and with cache, respectively. The analytical expressions of outage probability and symbol error rate are derived, and the system diversity order is improved fast when the cache is adopted. Another paper considers a signal detection problem in spatial modulation 3D-MIMO systems, and the normalization preprocessing and structured sparsity of sparse signals are exploited to avoid the overamplified noise and reduce computation, respectively. Simulation results prove that the proposed algorithm in this paper surpasses the conventional signal detectors.

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