Editorial: Recent Advances on Communication Signal Processing and Networking

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Editorial:

Due to the rapid developments in the field of communication technologies, signal processing and networking are paid great attentions in the next generation mobile networks to meet the demands of the massive connectivity and ubiquitous networking. 5G technologies are no longer limited to traditional contexts and platforms with huge potential. Several solutions have been proposed such as Massive MIMO, narrow band IoT (NB-IoT), NOMA, Zigbee, IEEE 802.11 and update of communication devices. Mobile networks have a large scale of potential applications like secure communication, cyber physical systems, multimedia communication and Internet of things environment. However, the application still faces challenges due to key limitations such as constant mobility, limited capability, restricted power, unguaranteed security, etc., which bring great challenges for technical research. The goal of this special issue is to bring the theoretical preparations and practical applications of research contribution in communication signal processing and networking.

This special issue features six selected papers with high quality. In the first article, “A Carrier Selection Method Based on Single RF Chain SM-OFDM Systems”, a carrier selection method based on single RF chain SM-OFDM systems is proposed, a carrier grouping method for carrier selection and precoding are considered to reduce system complexity. Compared with the conventional SM-OFDM system, only single RF chain is used which avoids the inter-antennas interference and improves the energy efficiency. Moreover, the computational complexity of the system is greatly reduced.

The next article with the title “Antenna Selection in TDD Massive MIMO Systems” proposes an antenna selection method based on EE in uplink massive MIMO systems. Based on the channel state information (CSI) and the 2-

norm of channel matrix, the antennas with better CSI are selected for data transmission. By switching of the RF chain among multiple antennas dynamically over time, simulation results show that the EE can be enhanced compared with conventional massive MIMO system, and the trade-off between EE and spectral efficiency (SE) of the system can be achieved.

In recent years, relaying technique and non-orthogonal multiple access (NOMA) are introduced to visible light communication (VLC) system to improve the system performance. In “A Novel Relay-Assisted DCO-OFDM Green VLC System Based on NOMA”, the authors studied a novel relay-assisted VLC system based on NOMA. All the source-to-relay and relay-to-destination links in the proposed system use DCO-OFDM scheme to transmit information. The relay terminal serves two destination terminals at the same time. The signals in these two relay-to-destination links are superposed in the power domain based on NOMA. The total throughput with different parameters such as power allocation factors and DC bias is modeled and deduced in this paper.

The fourth article titled “Image Compression and Encryption Algorithm Based on Hyper-chaotic Map” is an extension of previous work. In the paper, aiming at overcoming defects which are low security properties, high costs of storage and transmission for exiting image encryption and compression algorithms. An algorithm which combined image compression and encryption based on hyper-chaotic map is proposed. In this algorithm, the original image is compressed by compression sensing (CS), and then the compressed image is encrypted through improved Arnold matrix transformation algorithm, Modular operation algorithm and combined the 3D hyper-chaotic map.

The authors of the fifth paper “Characteristics Analysis of the Fractional-Order Chaotic Memristive Circuit Based on Chua’s Circuit” define a new fractional-order memristive circuit based on canonical Chua’s circuit and Voltage-controlled memristor model. The fractional-order chaotic system is solved by conformable adomian decomposition method (CADM), and the complexity characteristics are analyzed

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through sample entropy (SampEn) algorithm. What's more, the chaos diagrams of complexity with the two parameters variation and the three parameters variation are analyzed.

The last article titled “A Multipath Routing Protocol with Load Balancing and Energy Constraining Based on AOMDV in Ad Hoc Network” designed a routing protocol based on load balancing with energy constraining, which selects nodes with lower queue length of MAC layer interface queue and higher residual energy to forward packets. The simulation results show that the performance of the improved protocol in terms of the number of energy exhausted node, average end-to-end delay and routing discovery frequency has been effectively improved.

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