Special Issue

Active or Passive Metasurface for Wireless Communications

Message from the Guest Editors

Metasurfaces pervade wireless communications via their expressions in multiple-input multiple-output (MIMO), millimeter wave and terahertz, full-duplex, edge computing, non-orthogonal multiple access, cognitive radio, physical layer security, backscatter, simultaneous wireless information and power transfer (SWIPT), localization, etc. Depending on whether radio frequency (RF) chains are involved or not, metasurfaces can be divided into two categories: active and passive metasurfaces. Typical examples of the difference include passive intelligent reflection surface (IRS)/ reconfigurable intelligent surface (RIS) and active holographic metasurfaces. Currently, metasurfaces are primarily used to reconfigure wireless environments or to act as transceivers. Accompanying these applications, however, is the skyrocketing difficulty of hardware overheads, computational complexity, power consumption, interference management, etc. Conversely, the potential of metasurfaces remains effectively unrealized. New related technologies or applications deserve to be explored, such as microwave/ RF QR code, RF neural network, holographic imaging, etc.

Guest Editors

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