CALL FOR PAPERS

IEEE Journal of Selected Topics in Signal Processing

Special Issue on Advanced Signal Processing for Terahertz Communications in 6G and Beyond Networks

Terahertz (THz) communications is envisioned as an enabling and highly promising wireless technology for the sixth generation (6G) and beyond wireless networks which aim to provide full and unlimited wireless connectivity for the ubiquitous intelligent information society of 2030 and beyond. Aligning with the current standardization efforts of 6G, the ultra-wide THz band ranging from 0.1 to 10 THz offers enormous potential to alleviate the spectrum scarcity and break the capacity limitation of emerging wireless systems (such as 4G-LTE and 5G). This will undoubtedly support the epoch-making wireless applications that demand ultra-high quality of service requirements and multi-terabits per second data transmission in the 6G and beyond era, such as holographic communications, extended reality, ultra-high-definition content streaming, ultra-fast backhaul and wireless local area networks, and wireless high-bandwidth secure transmission.

Although THz communications owns such appealing potentials, it introduces many new signal processing challenges such as channel modeling and estimation, waveform and modulation design, physical layer transmission and reception design, and performance analysis and verification. To tackle these challenges, this special issue seeks to bring together researchers from academia and industry to introduce the latest advances in signal processing of THz communications. Topics of interest include, but are not limited to:

- THz propagation, channel modeling and measurement
- THz waveform and modulation design
- THz channel estimation algorithms
- Joint THz channel coding and data detection strategies
- Time, frequency and phase synchronization in ultra-broadband THz communication
- Versatile design of THz communications and signal processing for satisfying a wide range of performance requirements (e.g., rate, throughput, reliability, connectivity, latency, and security)
- Robust design of THz communications and signal processing under imperfect channel state information and/or hardware impairment
- Resource allocation and/or interference management in THz communication systems
- Signal processing algorithms for security and covertness in THz communication systems
- Joint design of THz systems and emerging wireless techniques (e.g., intelligent reflecting surfaces, unmanned aerial vehicles, and massive access)
- Artificial intelligence aided signal processing for THz communication systems
- Theoretical performance analysis of THz signal processing algorithms
- Real-world prototypes and testbeds of signal processing for THz communication systems

The Guest Editors also welcome creative papers outside the areas listed above but related to the overall scope of the special issue. Prospective authors may contact the Guest Editors to ascertain interest on topics that are not listed, should follow the instructions given on the IEEE JSTSP webpage: https://signalprocessingsociety.org/publications-resources/ieee-journal-selected-topics-signal-processing, and submit their manuscripts at http://mc.manuscriptcentral.com/jstsp-ieee. All submitted manuscripts will be peer-reviewed according to the standard IEEE process.

Important Dates

- Manuscript Due: December 10, 2022 (Firm)
- First Review Due: January 31, 2023
- Revised Manuscript Due: March 31, 2023
- Second Review Due: May 15, 2023
- Final Manuscript Due: June 30, 2023
- Publication Date: September 2023

Guest Editors

- **Nan Yang** (**Lead**), Australian National University, Canberra, Australia (nan.yang@anu.edu.au)
- **Chong Han**, Shanghai Jiao Tong University, Shanghai, China (chong.han@sjtu.edu.cn)
- **Josep Miquel Jornet**, Northeastern University, Boston, USA (j.jornet@northeastern.edu)
- **Peiying Zhu**, Huawei Technologies, Ottawa, Canada (peiying.zhu@huawei.com)
- **Markku Juntti**, University of Oulu, Oulu, Finland (markku.juntti@oulu.fi)