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CALL FOR PAPERS

Intelligent Communications for Shared Prosperity

SAC Symposium: Integrated Sensing and Communication

Co-Chair

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Scope and Motivation

As the standardization of 5G has gradually been solidified, researchers have speculated what 6G will be. A common theme in many perspectives is that 6G Radio Access Network (RAN) should serve as edge infrastructure to provide site-specific services for surrounding users, rather than communication-only functionality. Jointly suggested by recent advances from the signal processing society and the communications society, radio sensing functionality can be integrated into 6G RAN in a low-cost and fast manner. Therefore, the future cellular network could image and measure the surrounding environment to enable advanced location-aware services, ranging from the physical layer to application layers. This type of research is typically referred to as Integrated Sensing And Communication (ISAC).

In essence, ISAC can acquire two main advantages over dedicated sensing and communication functionalities: 1) Integration gain to efficiently utilize congested resources for dual use of both communications and sensing, and even more interesting, 2) Coordination gain to balance dual-functional performance or/and perform mutual assistance. That is, via the shared use of spectrum and hardware resources, ISAC can be realized through a synergistic design to pursue the integration gain, e.g., cohabitation strategies with interference management. Moreover, it can also be implemented from a co-design perspective, wherein the communications and sensing functionalities are simultaneously performed via unified waveform to optimize the performance to acquire the coordination gain jointly. Benefiting from these two advantages, applications of ISAC have been extended to numerous emerging areas, including vehicular networks, environmental monitoring, Internet of Things, as well as in-door services such as human activity recognition.

Despite having drawn huge attention from both academia and industry, many open problems still remain to be investigated. This SAC track aims at bringing together researchers from academia and industry to identify and discuss the major technical challenges, recent breakthroughs, and novel applications related to ISAC.

Topics of Interest

Original research articles are solicited in, but not limited to, the following topics:

- Fundamental information theoretical limits for ISAC
- Network architectures/transmission protocols/frame designs for ISAC

- Spectrum analysis and management of ISAC
- Full duplex/interference management techniques of ISAC
- Precoding/waveform/modulation/receiver design for ISAC
- Security and privacy issues for ISAC
- Machine learning/Network Intelligence for ISAC
- MIMO/Massive MIMO/intelligent reflecting surface (IRS)/Holographic MIMO surface for ISAC
- Millimeter wave/THz technologies for ISAC
- ISAC for unmanned aerial vehicles (UAV)
- ISAC for vehicular-to-everything (V2X) networks
- Standardization progress of ISAC
- Wi-Fi sensing/positioning/detection for ISAC
- Experimental demonstrations and prototypes

Biographies of the Co-Chair

Fan Liu is currently an Assistant Professor of the Department of Electrical and Electronic Engineering, Southern University of Science and Technology (SUSTech). He received the Ph.D. and the BEng. degrees from Beijing Institute of Technology (BIT), Beijing, China, in 2018 and 2013, respectively. He has previously held academic positions in the University College London (UCL), first as a Visiting Researcher from 2016 to 2018, and then as a Marie Curie Research Fellow from 2018 to 2020. Dr. Fan Liu's research interests include the general area of signal processing and wireless communications, and in particular in the area of Integrated Sensing and Communications (ISAC). He has 10 publications selected as IEEE ComSoc Besting Readings in ISAC. He is the Founding Academic Chair of the IEEE ComSoc ISAC Emerging Technology Initiative (ISAC-ETI), an Associate Editor for the IEEE Communications Letters and IEEE Open Journal of Signal Processing, a Lead Guest Editor of the IEEE Journal on Selected Areas in Communications, and a Guest Editor of the IEEE Wireless Communications. He is the TPC Co-Chair of the 2nd and 3rd IEEE Joint Communication and Sensing Symposia (JC&S). Dr. Liu was listed in the World's Top 2% Scientists by Stanford University for citation impact in 2021 and 2022. He was also the recipient of the IEEE Signal Processing Society Young Author

Best Paper Award of 2021, the Best Ph.D. Thesis Award of Chinese Institute of Electronics of 2019, and

How to Submit a Paper

All papers for technical symposia should be submitted via EDAS. Full instructions on how to submit papers and important deadlines are posted at <https://globecom2023.ieee-globecom.org/>