

# INTEGRATION SENSING AND COMMUNICATION FOR 6G: WAVEFORM DESIGN, RESOURCE ALLOCATION, APPLICATION AND PROTOTYPE DEMO



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## **【Abstract】**

Integration of Sensing and Communication (ISAC) is a key use case in emerging 6G networks, aiming to enhance situational awareness and improve network efficiency. By simultaneously sensing the environment and transmitting data, ISAC enables advanced applications such as autonomous driving and smart cities. However, challenges remain in spectrum sharing, interference management, and real-time processing, requiring innovative solutions in signal design and resource allocation. In this talk, we first describe the motivation, history, waveforms and tradeoffs. Then we briefly explain some of our recent works supported by US National Science Foundation including Cross-domain Waveform Design, Multiuser Resource Allocation, RIS-ISAC: DISCO PLS Attack, High Speed Train and Optical ISAC. Finally, we show our prototype demo in IEEE ICC 2024 and Milcom 2024, and then discuss the standardization and future work.