

RESEARCH SEMINAR

Towards Secured ISAC upon Commodity Wi-Fi



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Date : 18 December 2023 (Mon)

Time : 3:00 pm - 4:00 pm

Venue : N003

Abstract

Given the increasing pervasiveness of Wi-Fi deployments and the awareness of Wi-Fi sensing capability, making sensing and communications both available on commodity Wi-Fi devices has become imperative. However, different from the well-studied ISAC (integrated sensing and communication) framework, transferring Wi-Fi toward ISAC faces two major challenges. On one hand, the focus is not designing (modulation) waveform but rather adapting what Wi-Fi communications already use towards sensing capability while maintaining communication quality. On the other hand, the security issue that was never considered under ISAC has to be seriously taken into account, simply because Wi-Fi's pervasive adoption.

In this talk, we first propose an evolving path of making Wi-Fi ISAC-ready, without making any fundamental changes to existing Wi-Fi cards. Based on that, we also point out a potentially (easily mounted) attack that may exploit such ISAC Wi-Fi. Finally, we propose a security mechanism; it mimics what digital encryption does to digital messages, but it performs physical encryption on physical behaviors (e.g., hand gesture).

About the Speaker

Prof. LUO Jun is a tenured faculty member in NTU and a Fellow of IEEE. He has been working on wireless sensing, deep learning, and computing system integration for more than two decades. Upon this foundation, he has made contributions on mobile/ pervasive computing and smart sensing technologies, by leading several national research projects and corporate labs (including MoE Tier2, BMW, SAP, and CSIJRI), aiming to transfer the research outcomes to practical applications. Meanwhile, Prof. Luo has kept publishing at top venues such as MobiCom, CCS, CVPR/ICCV, SenSys, S&P, INFOCOM, UbiComp, ToN, and TMC. With only 150+ publications, he has earned over 9700 Google Scholar citations, with two top-cited paper bearing nearly 2,300 of them. More detailed information can be found at: <https://personal.ntu.edu.sg/junluo/>.