

Artificial Intelligence for Integrated Sensing and Communications (ISAC) for 6G

Integrated Sensing and Communications (ISAC) plays a pivotal role in future 6G communications. As an emerging paradigm, ISAC unifies wireless communication and radar sensing functionalities within a single system, offering significant benefits such as improved spectrum efficiency, reduced power consumption, and enhanced cost-effectiveness. The applications of ISAC are diverse, ranging from environment sensing, human and health monitoring, to automotive and drone navigation. Despite its potential, ISAC face significant challenges such as managing interference between communication and sensing signals, particularly in full-duplex systems where both functions operate simultaneously and ensuring adaptability in diverse and dynamic environments. Artificial intelligence has the potential to enhance the processing capabilities of ISAC systems, significantly enhancing their performance in detection, classification, and estimation. This project aims to develop AI-based algorithms tailored for ISAC, with prototypes of these algorithms to be implemented on software-defined radio platforms to demonstrate ISAC's practical capabilities.

The candidate will be part of the [Future Communications Translation Lab \(FCTLab\)](#) in SIT, a national lab funded by the Infocomm Media Development Authority (IMDA) Singapore. Equipped with private 5G testbeds and advanced communications and network test and measurement instruments, the lab facilitates the practical validation and refinement of new wireless technologies. The strong partnership between FCTLab and industry collaborators will also support real-world trials, bridging the gap between theoretical research and practical solutions.