

Communications and networking play an essential role in modern societies, connecting people and things and enabling numerous applications for improving safety, productivity, and quality of life.

At the Wireless and Internet of Things (WIT) Lab, we investigate the challenges in existing wireless communications and wireless networks and develop solutions to advance the research field. Example research topics include network architecture innovation for 5G and beyond, ultra-low latency networking solutions for industrial Internet of Things, protocol design for vehicle-to-everything communication and intelligent transportation, as well as integrated satellite and terrestrial networks. For each research topic, we tailor our solution for real-world and industrial application.

Our research connects network users, network data, quality of service demands, network resources, and network performance. We explore both model-driven methods, such as optimization or game theory, and data-driven methods, such as machine learning, to analyze and optimize communication and networking solutions.

The WIT lab is directed by Dr. Jie Gao, assistant professor of electrical and computer engineering. Before joining Marquette, Dr. Gao worked as a research associate and postdoctoral fellow at several universities in Canada, including the University of Waterloo, Ryerson University, and the University of Alberta, and participated in or led various research projects, such as "AI-driven next-generation networks" and "connected vehicle testbed for intelligent transportations." Dr. Gao is a senior member of IEEE, a member of the IEEE communications society and the IEEE vehicular technology society, and an associate editor for IEEE Vehicular Technology Section and Springer Peer-to-Peer Networking and Applications.

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