

Novel Antenna and Architecture for Future 6G Wireless Communication and Sensing



Dr. Wen Tong is the CTO, Huawei Wireless. He is the head of Huawei wireless research. In 2011, Dr. Tong was appointed the Head of Communications Technologies Labs of Huawei, currently, he is the Huawei 5G chief scientist and leads Huawei's 10-year-long 5G wireless technologies research and development. Prior to joining Huawei in 2009, Dr. Tong was the **Nortel Fellow** and head of the Network Technology Labs at Nortel. He joined the Wireless Technology Labs at Bell Northern Research in 1995 in Canada. Dr. Tong is industry recognized leader in invention and standardization of advanced wireless technologies, he is the key contributor to 3GPP since its inception. Dr. Tong was elected as a **Huawei Fellow** and an **IEEE Fellow**. He was the recipient of IEEE Communications Society Industry Innovation Award for "the leadership and contributions in development of 3G and 4G wireless systems" in 2014, and IEEE Communications Society Distinguished Industry Leader Award for "pioneering technical contributions and leadership in the mobile communications industry and innovation in 5G mobile communications technology" in 2018. He is also the recipient of R.A. Fessenden Medal. For the past three decades, he had pioneered fundamental technologies from 1G to 5G wireless with more than 490 granted US patents. Dr. Tong is a **Fellow of Canadian Academy of Engineering**, and he also serves as Board of Director of WiFi Alliance. He is based in Ottawa, Canada.

Abstract:

6G will feature the networked sensing capability. Future 6G system will consider the full frequency bands (centimetre wave, millimeter wave and sub-terahertz), larger bandwidth, and denser distribution of large-scale antenna arrays. It will be the important enabler for integrating wireless sensing and communication into a single system. Because wireless sensing and communication focus on different key performance indicators, the integrated sensing and communication capabilities imposes higher requirements on antenna design in 6G wireless systems. The classical active phased array may have the best radiation performance. But the problems of high costs and complexity will be challenging. In contrast, the passive reconfigurable antennas based on PIN diode, liquid crystal, phase change material, etc., have

advantages of low cost and lower power consumption. But the radiation performance is limited. Therefore, it is necessary to investigate how to design an antenna architecture that meets both sensing and communication requirement with low-cost and easy of deployment.

Workshop outline:

This workshop will discuss new antenna and architectures for both wireless sensing and wireless communication systems. For large-scale antenna array deployments, costs and performance are always to be considered. Therefore, novel antenna and architecture with low cost and high performance will be discussed in detail.

Presentations, followed by Q&A + Panel discussion

Duration: 90 minutes