

## PhD Oral Defense

**Date:** 21 January 2021 (Thursday)

**Time:** 10:00am

### Thesis Title

**Research on High-Gain Millimeter-Wave and Terahertz Antennas for 5G and Beyond**



**Mr WU Gengbo (Supervisor: Prof. CHAN Chi Hou)**

### Abstract

At the dawn of the fifth generation (5G) wireless communications era, the ever increasing demand for higher data transmission rate continues to drive carrier frequencies into the millimeter-wave (MMW) and terahertz (THz) bands for improved channel capacities. However, the increase of the operating frequency imposes significant challenges in MMW and THz antenna design; it incurs high atmospheric absorption loss, significant metal and dielectric material losses, and limited fabrication tolerance. In this thesis, we present several high-gain antenna solutions to address these challenges by developing a unique inexpensive three-dimensional (3-D) printing fabrication process, exploring the new concept of amplitude-modulated (AM) leaky-wave antennas and adopting orbital angular momentum (OAM)-based multiplexing.