



Technical Co-sponsor: IEEE Hong Kong Section
Robotics and Automation/Control Systems Joint Chapter

Jointly presents

SEMINAR SERIES ON COMPLEX SYSTEMS, NETWORKS, CONTROL AND APPLICATIONS

**Ultrahigh Resolution Optical Vector Analysis
based on Microwave Photonics**

Dr Min Xue

Department of Electronic and Information Eng., Hong Kong Polytechnic University

Date and Time: Friday, 12 April 2019, 4:30pm – 5:30pm

Venue: Room **CD634**, Hong Kong Polytechnic University

Reception starts at 4:15pm

(Language: **English**)

Abstract

Knowing the high-resolution frequency responses, including magnitude and phase responses, are of great importance for development, fabrication and application of high-finesse optical devices and innovative photonics integrated circuits (PIC). Conventionally, optical vector analyzers (OVAs) based on modulation phase-shift approach or interferometry approach measure the frequency responses by sweeping the wavelength of a laser source. The resolution is usually larger than 1.6 pm (e.g., 200 MHz at 1550 nm), which is too coarse to observe the fine structure of the frequency responses of the high-finesse optical devices and innovative photonics integrated circuits. To achieve ultrahigh resolution measurement, OVAs based on microwave photonics (MWP) technologies have been proposed and developed. The method can potentially achieve sub-Hz resolution in theory and a resolution of 78-kHz has been experimentally achieved, but electrical-to-optical and optical-to-electrical conversions are required to implement the electrical frequency sweeping and to detect the phase and magnitude information in the electrical domain, which limits the frequency measurement range, measurement accuracy and dynamic range. This presentation gives a brief review of the recent progress in developing MWP-based OVAs and the prospective for different applications is discussed.

About the Speaker

Min Xue received the B.S. and Ph.D. degrees in the College of Electronic and Information Engineering from Nanjing University of Aeronautics and Astronautics, China, in 2011 and 2016. He joined the College of Electronic and Information Engineering, Nanjing University of Aeronautics and Astronautics, China, in 2016, where he is currently a member of the Key Laboratory of Radar Imaging and Microwave Photonics, Ministry of Education. He awards “Hong Kong Scholars” in 2018 and Gold Medal with the congratulations of the jury in the 45th International Exhibition of Inventions of Geneva in 2017. His research interests include photonic microwave measurement and metrology, optical fibre sensor, and integrated microwave photonics. He serves as a Publication Co-Chair of IEEE International Topical Meeting on Microwave Photonics in 2017.