SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Microelectronic Technologies & Devices

Host: Associate Professor Mankei Tsang

TOPIC	:	**Quantum Inspired Super-Resolution via Spatial Mode Demultiplexing**
SPEAKER	:	**Mr. Tan Xiaojie** **Graduate Student, ECE Dept, NUS**
DATE	:	**Wednesday, 10 May 2023**
TIME	:	**2:00PM to 2:30PM**
VENUE	:	**Join Zoom meeting:** https://nus-sg.zoom.us/j/83186706409?pwd=Rk5KeTkrWHgrMzd2TDhFNXpRbmNVZz09 **Meeting ID: 831 8670 6409** **Passcode: 995181**

ABSTRACT

The resolution of an imaging system is essentially limited by Rayleigh's criterion, as a result of the diffraction nature of light. Pursuing super-resolution that breaks the diffraction limit is an ultimate goal in the areas of optical imaging. According to quantum detection and estimation theory, it is proved that spatial mode demultiplexing (SPADE) technique can provide sub-diffraction resolution that achieving the quantum limit. In this seminar, we theoretically illustrate how SPADE technique can distinguish arbitrary small separations between two incoherent point sources and attains the resolution bounded by quantum theory. Meanwhile, we experimentally perform SPADE based imaging in both one-dimensional and two-dimensional scenarios, where the super-resolution of laser sources is observed. These results demonstrate the application of SPADE in practical super-resolution microscopy.

BIOGRAPHY

Mr. Tan Xiaojie is currently pursuing his PhD degree at the Department of Electrical and Computer Engineering, National University of Singapore, supervised by Prof. Mankei Tsang. His research mainly focuses on the application of quantum information in super-resolution optical imaging.

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