SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
Faculty of Engineering
Website: https://www.eng.nus.edu.sg/ece/

Area: Microelectronic Technologies and Devices

Host: Dr Evgeny Zamburg

TOPIC	:	**Defect-Engineered WSe2 Memtransistor To Enable Floating-Gate-Resistive Reconfigurable Synapses**
SPEAKER	:	**Mr Leong Jin Feng** **Graduate Student, ECE Dept, NUS**
DATE	:	**Wednesday, 21 April 2021**
TIME	:	**10.00AM to 11.00AM**
WEBINAR	:	**Join Zoom Meeting** **https://nus-g.zoom.us/j/89605633723?pwd=bWRPVmJvZmVkV1ZSTFQvUU9NWkhpdz09** **Meeting ID: 896 0563 3723** **Password: 425191**

ABSTRACT

Memtransistors, an emerging type of device where the electrostatically coupled gate terminal governs the memristive charge transport, are potential candidates for applications revolving in-memory computing and neuromorphic computing. However, the accurate determination of memory states and understanding of device physics across all operational regimes remains a challenge with existing models. Here, we show through detailed modelling and electrical characterization, that charged vacancy induced channel potential changes and self-heating in memtransistors to be dominating influences on their memory operations. Neglected by prior work, resistive memory effects in memtransistors were thought to originate from mostly vacancy-modulated schottky barrier changes at the transistor contacts. Leveraging new insights into transistor channel electrostatics and device self-heating, we propose a new class of memtransistors that operate with a floating gate to enable reconfigurable ambipolar resistive switches; capable of implementing excitatory and inhibitory synapses to enhance neuromorphic computational performance.

BIOGRAPHY

Leong Jin Feng is currently a PhD student in Electrical and Computer Engineering Department, National University of Singapore. His research mainly focuses on two-dimensional materials based memory devices.