

## SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING  
COLLEGE OF DESIGN AND ENGINEERING

Website: <https://cde.nus.edu.sg/ece>

**Area: Microelectronic Technologies & Devices (MTD)**

**Host: Dr Huo Jiali**

TOPIC	:	Novel MoS <sub>2</sub> Dual-Gate FET with a Highly Scaled EOT for Reconfigurable Logic Gate and High-Precision Analog Synapse
SPEAKER	:	Ms Li Lingqi Graduate Student, ECE Dept, NUS
DATE	:	Tuesday, 8 July 2025
TIME	:	3:00PM to 4:00PM
VENUE	:	Join Zoom Meeting <a href="https://nus-sg.zoom.us/j/82327633256?pwd=gaNzPPbm9b9QgqnMvWinZFhMb9Zj8t.1">https://nus-sg.zoom.us/j/82327633256?pwd=gaNzPPbm9b9QgqnMvWinZFhMb9Zj8t.1</a> Meeting ID: 851 1250 2721 Passcode: 2ZCUtR

### ABSTRACT

We report on a dual-gate transistor with a scaled equivalent oxide thickness (EOT) of approximately 2.4 nm for reconfigurable logic gates and high-precision analog synapses applications. By employing Hf seeding layer dielectric engineering, we were able to deposit a high-k dielectric uniformly and with good coverage on the MoS<sub>2</sub> surface, without causing obvious channel damage. Our device achieved among the lowest subthreshold swing (S.S.) of approximately 83 mV/dec with top gate (TG) configuration and 63 mV/dec with dual-gate (DG) configuration at a small gate bias. Moreover, we proposed a one-transistor structure that leverages reconfigurable logic gate functions (both 'AND' and 'OR' gate) and high-performance synapse capabilities (6 bit/cell, 94.17% accuracy), by strategically designing the gate dielectric layers of top and bottom gates.

### BIOGRAPHY

Ms. Li Lingqi is currently pursuing a Ph.D. degree in the Department of Electrical and Computer Engineering at NUS. Her supervisor is Prof. Ang Kah Wee. Her research focuses on energy-efficient neuromorphic computing based on 2D electronic synaptic devices.

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