

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	:	Advancing 2D Memristor Precision for AI at the Edge
SPEAKER	:	Mr Thaw Tint Te Tun Graduate Student, ECE Dept, NUS
DATE	:	Tuesday, 8 July 2025
TIME	:	2:00PM to 3:00PM
VENUE	:	Join Zoom Meeting https://us05web.zoom.us/j/88249642368?pwd=hGbk0uauXxaHBt80LgoV9VImAUFpl.1 Meeting ID: 882 4964 2368 Passcode: 3ruT18

ABSTRACT

Memristor crossbars with programmable conductance are being actively explored as a route to efficient multiply-and-accumulate (MAC) operations, making them attractive for edge AI inference tasks where power and speed are critical. In this talk, I will present our recent work on few-layer tin hexathiophosphate (SnP₂S₆) memristors, where we achieved 325 stable conductance states using a pulse-based programming approach. To address current noise, which typically limits precision, we analyzed filament evolution during switching and developed a pulse scheme to stabilize conductance tuning. Using these multi-level states, we implemented a temporal convolutional neural network (TCN) with up to 8-bit kernel precision on an SPS memristor crossbar. The system achieved 92.42 percent inference accuracy on a subset of the HAR70+ dataset and demonstrates the potential of SPS-based memristors for compact and efficient neuromorphic computing at the edge.

BIOGRAPHY

Thaw Tint Te Tun received his bachelor's degree in Electrical and Electronic Engineering from Nanyang Technological University (NTU), Singapore, in 2023. He is currently pursuing a Ph.D. in Prof. Ang Kah Wee's group in the Department of Electrical and Computer Engineering at the National University of Singapore (NUS). His research interests include 2D materials-based devices, such as memristors and memtransistors.

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