

## Presentation Title - Resistive Devices and Circuits for Neuro-Inspired Computing

· Presentation Abstract: Neuro-inspired computing is a new computing paradigm that emulates the neural network for intelligent information processing. To build the large-scale neuromorphic system, it is necessary to develop the compact nanoscale devices to support the synaptic and neuronal functions. In this presentation, I will discuss the recent progresses in the integration of oxide based synaptic and neuronal devices in deep learning accelerators. First, I will discuss the desired characteristics of the resistive synaptic devices (e.g. multilevel states, read disturb) for inference and in-situ training, respectively. Second, I will discuss the oscillation neuron devices to serve as the analog-to-digital converter at the edge of crossbar array for weighted sum operation. Then we will present our recent XNOR-RRAM prototype chip at 90nm that integrates the RRAM with CMOS peripheral circuitry for compute-in-memory, achieving the superior energy efficiency and throughput. Lastly, I will present our developed DNN+NeuroSim framework for technological benchmarking for deep learning accelerators.