

< Title >

Neuro-Inspired Processor Design for On-Chip Learning and Classification with CMOS and Resistive Synaptic Devices

< Abstract >

In recent years, both industry and academia have shown keen interest in neuromorphic computing and its hardware design for cognitive applications. Although off-chip training is commonly performed, on-chip learning is crucial to accelerate training or continuously adapt with real-time sensory input. In this talk, I will present our exemplary research on low-voltage digital CMOS neuromorphic processor design with on-chip learning, including on-chip STDP (spike-timing dependent plasticity) learning for pattern recognition (45nm) and spiking clustering for deep-brain sensing (65nm). I will also briefly discuss our research on neuromorphic architectures and circuits that employ resistive devices (RRAM) as high-density synapses.