CHAI Seminar Series

Refreshments will be served.

DATE: **Monday, February 20, 2023, 12:00-1:00 PM**

SPEAKER: **Rashmi Jha, PhD,** Professor of Electrical and Computer Engineering and Director of Microelectronics and Integrated-Computing Systems with Nanoelectronic Devices (MIND) Laboratory, University of Cincinnati

TITLE: **Emerging Memory Devices and Their Applications in Neuromorphic Computing**

IN PERSON: **Golisano Hall, Room 2400**

ABSTRACT: Emerging memory devices have drawn significant attention for in-memory computing that has potential to overcome the memory-bandwidth limitations of existing neuromorphic architectures and provide viable approaches for accelerating Artificial Intelligence (AI) and Machine Learning (ML) algorithms at low power. Existing neuromorphic architectures based on Ferroelectric Field Effect Transistors (FeFETs) and various Resistive Memories have mostly explored dot-product based computing approaches where variable weights can be stored in the conductive states of these devices. Our research capitalizes on the unique device physics of FeFETs and demonstrate their applications in Euclidean distance calculation-based computing approaches. This provides tremendous potential to accelerate various existing data clustering techniques used in ML. The talk will demonstrate the applications of FeFET-based clustering approaches in data labeling and some other brain-inspired unsupervised learning applications and cover our work on gated-RRAMs and their applications in enabling novel approaches for neuromorphic computing.

BIO: **Dr. Rashmi Jha** is Professor of Electrical and Computer Engineering at the University of Cincinnati. She worked as a Process Integration Engineer for Advanced CMOS technologies at IBM Semiconductor Research and Development Center prior to moving to academia. She obtained her Ph.D. and M.S. in Electrical Engineering from North Carolina State University and B.Tech. in Electrical Engineering from the Indian Institute of Technology (IIT) Kharagpur. She has 13 US patents and authored/co-authored several publications. She has been a recipient of a Summer Faculty Fellowship Award from AFOSR in 2021 & 2017, an NSF CAREER Award, an IBM Faculty Award, and an IBM Invention Achievement Award. Her current research interests lie in the areas of Advanced CMOS and Beyond CMOS Logic and Memory Devices, Cross-Technology Heterogenous Integration, Neuromorphic and Brain-Inspired Architectures for Artificial Intelligence (AI), Trusted Microelectronics, and Neuroelectronics.

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