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PRESENT

# BRAIN INSPIRED COMPUTING: THE EXTRAORDINARY VOYAGES IN KNOWN AND UNKNOWN WORLDS

BY


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**Abstract**: Human brain is the most sophisticated organ that nature ever built. Building a machine that can function like a human brain, indubitably, is the ultimate dream of a computer architect. Although we have not yet fully understood the working mechanism of human brains, the part that we have learned in past seventy years already guided us to many remarkable successes in computing applications, e.g., artificial neural network and machine learning. Inspired by the working mechanism of human brain, neuromorphic system naturally possesses a massively parallel architecture with closely coupled memory, offering a great opportunity to break the "memory wall" in von Neumann architecture. The talk will start with a background introduction of neuromorphic computing, followed by examples of hardware acceleration schemes of learning and neural network algorithms and memristor-based computing engine. I will also share our prospects on the future technology challenges and advances of neuromorphic computing.


**Biography**: Dr. Hai "Helen" Li is a Clare Boothe Luce Associate Professor with the Department of Electrical and Computer Engineering at Duke University. She received her B.S and M.S. from Tsinghua University and Ph.D. from Purdue University. At Duke, she co-directs the Duke University Center for Computational Evolutionary Intelligence. Her research interests include machine learning acceleration and security, neuromorphic circuit and systems for brain-inspired computing, conventional and emerging memory design and architecture, and software and hardware co-design. She received the NSF CAREER Award (2012), the DARPA Young Faculty Award (2013), TUM-IAS Hans Fisher Fellowship from Germany (2017), seven best paper awards, and another eight best paper nominations. Dr. Li is a fellow of the IEEE and a distinguished member of the ACM. For more information, please refer to her webpage at http://cei.pratt.duke.edu/.

**Registration:** free (https://meetings.vtools.ieee.org/m/204625).