Neuromorphic Computing Workshop
Architectures – Models – Applications
Call for Papers

June 29-Jul 1, 2016
Oak Ridge National Laboratory Conference Center
Oak Ridge, TN

The White House has announced a Nanotechnology-Inspired Grand Challenge for Future Computing,¹ which seeks to create a new type of computer that can “proactively interpret and learn from data, solve unfamiliar problems using what it has learned, and operate with the energy efficiency of the human brain”. This grand challenge is meant to leverage and synergize three of our national research and development initiatives: National Nanotechnology Initiative (NNI), National Strategic Computing Initiative (NSCI), and the BRAIN initiative.

We believe neuromorphic computing will play a major role in this new grand challenge, and has the potential to transform the way we use computers through new materials, new brain-inspired chips, greater understanding of neuroscience, and breakthroughs in machine understanding/intelligence. Neuromorphic computing systems have the potential to mimic the functionality of neural systems in the brain, which we believe will lead to more powerful and efficient computing paradigms. These new systems have the potential to help scientists pioneer new scientific discoveries, or to help intelligently analyze sensor data for improved cyber security or energy management.

The goal of this workshop is to define basic research challenges for neuromorphic computing research from the U.S. Department of Energy (DOE) Advanced Scientific Computing Research (ASCR) perspective. Our focus is to define a 10-20 year roadmap for neuromorphic computing that leverages the strengths and capabilities of the DOE National Laboratory system.

We invite you to submit a two-page white paper to our upcoming Neuromorphic Computing workshop. Abstract submission deadline is April 8, 2016, http://ornlcda.github.io/neuromorphic2016/.

Research white papers are requested in three Neuromorphic Computing focused areas:
(1) Architectures, Models, and Emulation, including network, neuron, and synapse models and efficient simulation techniques for large-scale networks.
(2) Machine intelligence algorithms and methods for programming or training neuromorphic devices, including supervised and unsupervised learning methods and biologically-inspired algorithms
(3) Applications for and use-cases of neuromorphic systems, especially those where neuromorphic systems have the potential to outperform state-of-the-art techniques

White paper Submissions must clearly identify the workshop attendee and include the following information: White paper Title, Name, Email, Organization, Focused Area (1–3, above) and Narrative (in Word or PDF format only). The submission is via the workshop website. Questions can be addressed to Dr. Thomas Potok, Dr. Catherine Schuman, Dr. Robert Patton, Dr. Todd Hylton, Dr. Helen Li, and Dr. Robinson Pino. Dr. Thomas Potok will serve as the General Workshop Chair. We look forward to your submission.

¹ https://www.whitehouse.gov/blog/2015/10/15/nanotechnology-inspired-grand-challenge-future-computing