Distinguished Lecturer
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“Neuro-Inspired Architectures: A New Paradigm in Computing”

Wednesday, November 19th at 4:30pm
In Wolff Auditorium

Development of digital electronics over the past several decades has dramatically changed the world in countless ways. But these architectures are not the most versatile, nor the most efficient computers in existence. The human brain is capable of performing many remarkable tasks that are difficult or impossible for today’s computers using only a fraction of the power. This talk will present a few current approaches toward implementing neuro-inspired computing architectures. A specific focus will be on large scale artificial neural networks which behave similarly to biology, including our approach using thin-film transistor circuits and memristors (non-linear resistors with memory). These have the advantage of implementing both short- and long-term synaptic plasticity (learning) and adaptation. Also, we can use materials which allow potential implementation of a biologically realistic physical topology. More specifically, the circuits could be fabricated quasi-three-dimensionally on flexible substrates, and be folded up much like the neocortex inside the skull.

Kurtis D. Cantley received his PhD in Electrical Engineering from The University of Texas at Dallas in 2011 after receiving the National Defense Science and Engineering Graduate (NDSEG) fellowship. Following a year of post-doctoral work at UT Dallas in Materials Science and Engineering, Dr. Cantley joined the faculty in the department of Electrical and Computer Engineering at Boise State University in 2013. Research in his group is broadly focused on the general capabilities and applications of artificial neural networks that mimic biology. In 2014, Dr. Cantley received the Young Investigator Award from the Air Force Office of Scientific Research (AFOSR) to develop circuits which learn to recognize temporal patterns within large sets of stimuli without supervision.