



CoCo Seminar Series

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Ongoing Work Evolving Spiking Neural Networks

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8:30-9:30am Engineering Building H-9
(Knoll-MacDonald Commons / Watson
Commons)



The recent emergence of spiking neural networks (SNNs) as a new NN computing paradigm has generated much interest both among neurological modelers as well as those interested in machine intelligence, including those producing NN hardware. I will describe one basic SNN model and then report of my efforts to use evolutionary computation to produce SNNs for specific purposes. Recent work has imbued our SNN simulator with three approaches to learning: Hebbian long-term unsupervised synaptic plasticity, a short-term (i.e. transient) frequency-based plasticity from Markram et al., and a more recent long-term supervised model (ReSuMe) from Ponulak. I will provide some thoughts on the computational differences between Turing machines and neural machines, and offer the conjecture that with neural machines the topology IS the algorithm and that the evolution of learning machines is an exciting prospect.

Dr. J. David Schaffer is a Visiting Research Professor at the Institute for Multigenerational Studies at Binghamton University. His research interests include theory and applications of evolutionary computation, machine learning, neural networks and bioinformatics. He is the recipient of the 2012 IEEE Computational Intelligence Society pioneer award in evolutionary computation.

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