School of Computer Science
M.S. Thesis Defense

By
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ADAPTIVE ART THROUGH ASYMMETRIC HEBBIAN LEARNING

ABSTRACT

Interactive art is an art form in which the art piece explicitly responds in some way to the presence or actions of a viewer. The viewer thus becomes a participant in the art making process. The interaction of most pieces is defined by a set fixed of rules. In this thesis, I propose an approach to interaction in which the participant can shape the behavior of the piece for a duration that extends beyond the interaction session. This approach is demonstrated using a simulation of a set of sensor network nodes. In my approach, each node behaves as a leaky integrate-and-fire model of a neuron. Synaptic connections between nodes are established through a modified Hebbian learning algorithm that combines Abbott and Song's spike time dependent plasticity with Bienenstock et.al's sliding threshold theory The distributed learning algorithm allows a visitor to easily configure short pathways through a set of neurons. In addition, the algorithm maintains the behavior of the network in a moderate state of varying activity, that is neither quiescent nor saturated. I demonstrate the viability of the learning algorithm through a series of small-scale simulation experiments.

Date: Wednesday, April 13, 2011

Time: 10:00 A.M. – 11:00 A.M.

Place: Seminar Room, SRTC

Committee members: Dr. Andrew H. Fagg – Chair
Dr. Dean Hougen
Prof. Adam Brown

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