**VLSI Design & Test Seminar ELEC 7950-001**

**Broun 235, August 17, 2011, 4PM**

**Research on Advanced Learning Algorithms of Neural Networks**

**(PhD Defense)**

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Learning algorithms and network architectures are two major topics in neural network realm. Error backpropagation (EBP) algorithms and multilayer perceptron (MLP) networks are often selected for neural network training because they are both easy for implementation. The tradeoff of this simplicity is that very large networks are required to solve practical problems. Recent research shows that the trained neural networks may have bad generalization ability if the size of neural networks is much larger than optimal. In order to design compact neural networks, second order algorithms and fully connected cascade (FCC) networks are recommended for training. In the dissertation, the forward-only algorithm combined with the improved second order computation is proposed to solve the computational redundancy and memory limitation in second order training. By inheriting from neuron-by-neuron computation, the proposed forward-only algorithm is capable of training arbitrarily connected neural networks. With the improved computation, second order algorithms can be applied to handle the problems with basically unlimited number of training patterns.

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Seminar Series: <http://www.eng.auburn.edu/~vagrawal/COURSE/E6200_Fall11/course.html>