

BISC Seminar

Date: Wed, April 30, 2008

Time: 4-5 pm

Room: 606 Soda Hall, Department of EECS, UC Berkeley

Speaker: Dr Saman Halgamuge

Associate Professor

School of Engineering; Biomedical Engineering

University of Melbourne

Topic: Discovering the almost unknown: a bio-inspired approach to Pattern Recognition and Optimization

Finding hidden patterns in data or grouping data is essential for making sense of present-day real life applications involving multi-dimensional, multi-scope large data sets. One possible avenue is to use unsupervised learning methods that do not depend on labels or predefined descriptions available for groupings. In Part 1 of this talk, I will discuss an algorithm on this category called Growing Self Organizing Maps which was developed by my group and its extension to semi-supervised learning strategies. The main advantage of this algorithm is the ability to adapt its structure using the data set features (i.e. learn), thus making it immensely useful for applications. Broadly, as a precursor to this work, while taking you on this journey on unsupervised learning path, I also discuss some of my contributions in the area of structure adapting neural network algorithms.

Interpretation of neural networks trained by supervised learning is extensively studied in last 25 years. Finding the equivalent fuzzy system for majority of such neural network is possible. This research has gained importance with our new work in semi-supervised learning. I will present a broad review of this area including my own work to highlight some of the advances in structure adapting neural networks in Part 2 of this presentation.

Part 3 of the talk will highlight some of the work conducted by my group in Particle Swarm Optimization and other work in the areas of Mechatronics and Bioinformatics. Some of this work includes industry projects on driver support systems and collaborative work in environmental genomics.

The presenter Dr Saman Halgamuge is an Associate Professor and Reader in School of Engineering of The University of Melbourne and a member of the school wide initiative of Biomedical Engineering. He received Dipl.-Ing (1990) and Dr.-Ing (1995) degrees in Computer Engineering from Technical University of Darmstadt, Germany. He leads a group of postdocs and PhD students working on Pattern Recognition and Optimization looking into problems in Bioengineering and Mechatronics.