Department of Computer Science
University of Houston

DISTINGUISHED LECTURERS SEMINAR
Fall 2010

WHEN: **MONDAY, NOVEMBER 29, 2010**
WHERE: **PGH 232**
TIME: **11:00 AM**

SPEAKER: Dr. Vikram Krishnamurthy, University of British Columbia

Host: Dr. Rong Zheng

TITLE: Social Learning for Reconfigurable Sensor Networks

Abstract:
Decentralized awareness in a sensor network requires decentralized information processing.
The idea is that if each sensor or small group of sensors can appropriately adapt their behavior to locally observed conditions, they can quickly self-organize into a functioning network, eliminating the need for difficult and costly centralized control.
This talk deals with decentralized information processing and social learning in sensor networks using game theoretic methods. The talk comprises of three parts. In the first part, we describe how social learning leads to the remarkable behavior of rational herding, where all sensors eventually end up taking the same action. In the second part of the talk, we illustrate how the theory of global games gives a powerful method for designing decentralized data-aware sensor activation algorithms in dense sensor networks. We show that the Nash equilibrium of the sensor network has a simple threshold structure and exhibits a remarkable phase transition as more data is collected. In the third part of the talk we describe how decentralized adaptive filtering algorithms with regret matching can be deployed in sensor networks to guide network behavior to a correlated equilibrium. A major theme of the talk is how simple local behavior can result in sophisticated global behavior.

Biography: Vikram Krishnamurthy received his bachelor's degree in Electrical Engineering from the *University of Auckland, New Zealand* in 1988 (with Honors I), and doctoral degree from the *Australian National University, Canberra* in 1992. Vikram Krishnamurthy is currently a Professor and Canada Research Chair in Signal Processing at the *Department of Electrical and Computer Engineering, University of British Columbia, Vancouver, Canada.* He also holds a BC Advanced Systems Institute Fellowship. His research interests are in Bayesian signal processing, game theory and stochastic control -- and their applications in sensor networks, wireless communications, and large scale biomolecular simulation.