STATISTICS COLLOQUIUM

MONDAY, SEPTEMBER 14, 2009
TALK: 4:00 PM — SCIENCE CENTER, ROOM 309
RECEPTION: 5:15 PM — SCIENCE CENTER, 7TH FLOOR

"Bayesian Learning in Social Networks"

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ABSTRACT

This talk will discuss different models of Bayesian learning by a group of agents represented as a social network. The first part focuses on observational learning. Each individual receives a signal about the underlying state of the world, observes the past actions of a stochastically-generated neighborhood of individuals, and chooses one of two possible actions. The stochastic process generating the neighborhoods defines the network topology (social network). We characterize equilibria for arbitrary stochastic and deterministic social networks and characterize the conditions under which there will be asymptotic learning---that is, the conditions under which, as the social network becomes large, individuals converge (in probability) to taking the right action. We show that when private beliefs are unbounded (meaning that the implied likelihood ratios are unbounded), there will be asymptotic learning as long as there is some minimal amount of "expansion in observations". We also characterize conditions under which there will be asymptotic learning under bounded private beliefs.

The second part focuses on learning based on communication. Each agent receives an initial signal and, in each period, communicates with his or her neighbors, and decides when to take an irreversible action. We characterize tight conditions under which there will be asymptotic learning, and show that truthful reporting is epsilon equilibrium in social networks that allow asymptotic learning.