



Information
Systems
Networks
Seminar



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“Information Aggregation and Social Learning in Networks”

Date: 12:00pm, Wednesday March 9th
Venue: Rhodes Hall 310

Over the past few years there has been a rapidly growing interest in analysis, design and optimization of various types of collective behaviors in networked dynamic systems. Collective phenomena (such as flocking, schooling, rendezvous, synchronization, and formation flight) have been studied in a diverse set of disciplines, ranging from computer graphics and statistical physics to distributed computation, and from robotics and control theory to sociology and economics. A common underlying goal in such studies is to understand the emergence of consensus from local interactions.

In this talk, I will discuss some of the recent advances in this area and their applications to information aggregation in social networks. I present a model of social learning in which agents try to discover an unknown state of the world by aggregating their private observations with the beliefs of their neighbors. Each agent's belief is updated as a weighted average of her Bayesian posterior (with respect to her own private observations) and the neighbors' beliefs.

When the underlying social network is strongly connected, I will show that weak and strong learning in the sense of Kalai and Lehrer occur under surprisingly mild assumptions. Furthermore, I will show that when the learning occurs, the rate of convergence of beliefs is exponential

Joint work with Pooya Molavi, Alireza Tahbaz-Salehi and Alvaro Sandroni

Pizza will be served 15 minutes prior to the start of the talk.

Short Bio: Ali Jadbabaie received his BS degree (with High honors) in Electrical Engineering from Sharif University of Technology in 1995. After a brief period of working as a control engineer, he received a Masters degree in Electrical and Computer Engineering from the University of New Mexico, Albuquerque in 1997 and a Ph.D. degree in Control and Dynamical Systems from California Institute of Technology in 2001. From July 2001-July 2002 he was a postdoctoral associate at the department of Electrical Engineering at Yale University. Since July 2002 he has been at the University of Pennsylvania, Philadelphia, PA, where he is currently the Skirkanich Associate Professor of Innovation in Electrical and Systems Engineering and Computer & Information Science, and the founding co-director of the Singh Program in Market and Social Systems Engineering, a new undergraduate program that blends Electrical Engineering with operations research, economics, and computer science.

He is a recipient of an NSF Career award, an ONR Young Investigator award, the O. Hugo Schuck Best Paper award of the American Automatic Control Council, and the George S. Axelby Outstanding Paper Award of the IEEE Control Systems Society. His students have been recipients and finalists of best student paper awards in the American Control Conference and IEEE Conference on Decision and Control. His research is broadly in the interface of control theory and network science, specifically, analysis, design and optimization of networked dynamical systems with applications to sensor networks, multi-robot formation control, opinion aggregation, social learning and other collective phenomena.
