Department of Computer & Information Science

Presents
Giovanni Neglia, Ph.D
Maestro, INRIA

Date: November 20, 2012
Time: 2:30-3:30pm
Place: JMH 342
Title: Distributed Weight Selection in Consensus Protocols by Schatten Norm Minimization

Abstract: In average consensus protocols, nodes in a network perform an iterative weighted average of their estimates and those of their neighbors. The protocol converges to the average of initial estimates of all nodes found in the network. The speed of convergence of average consensus protocols depends on the weights selected on links (to neighbors). In this talk we address how to select the weights in a given network in order to have faster speed of convergence than any other choice of weights. We approximate the problem of optimal weight selection by a distributed algorithm that solves an unconstrained minimization of a smooth and convex function. By tuning a parameter $p$ in our algorithm we can simply trade-off the quality of the solution (i.e. the speed of convergence) for communication/computation requirements (in terms of number of messages exchanged and data processed). The distributed algorithm uses gradient methods to perform optimization. Simulation results show that our approach provides very good performance already for values of $p$ that only needs limited information exchange. The weight optimization iterative procedure can also run in parallel with the consensus protocol. This is a joint work with other researchers from INRIA Maestro team: Mahmoud El Chamie and Konstantin Avrachenkov.

Bio: Giovanni Neglia is a researcher in Maestro team at INRIA. He received a master's degree in electronic engineering and a Ph.D. degree in telecommunications from the University of Palermo, Italy, in 2001 and 2005, respectively. In 2005 he was a research scholar at the University of Massachusetts Amherst, visiting the Computer Networks Research Group. Before joining INRIA as a permanent member in September 2008, he was a postdoc at the University of Palermo (from June 2005) and an external scientific advisor in Maestro team (from September 2006). His research focuses on modeling and performance evaluation of computer networks and proposals of new mechanisms to improve their performance. To this end he applied different mathematical tools (Markov processes, control theory, fluid models, game theory, gradient-based and metaheuristic optimization).

For more information please contact Ms. Palma Hutter at hutter@fordham.edu or 718-817-4480.