Electrical & Computer ENGINEERING

ENERGY AND INFORMATION SEMINAR

eis.ece.cmu.edu

Monday, Oct. 20

Hamerschlag Hall Room 1107 at 12:30 p.m.

Aarti Singh

Carnegie Mellon University

Power of Active and Compressive Queries for Subspace Learning

Aarti is A. Nico Habermann Assistant Professor in the Machine Learning Department at CMU. Her research leverages tools at the intersection of machine learning, statistics and signal processing to design principled algorithms that can enhance the tradeoffs between statistical, measurement and computational efficiency by judicious choice of where, what and how data is acquired, stored and processed. The vision is to introduce a new paradigm of intelligent machine learning algorithms that make high-level decisions in collaboration with humans, thus pushing the envelope of automated scientific and social discoveries. Her work is recognized by an NSF Career Award, a United States Air Force Young Investigator Award, a Faculty Chair Award, best student paper award at Asilomar, and Harold A. Peterson Best Dissertation Award. Aarti received a PhD in Electrical Engineering from University of Wisconsin - Madison and was a postdoctoral research associate in the Program in Applied and Computational Mathematics at Princeton University, prior to joining Carnegie Mellon.

Power of Active and Compressive Queries for Subspace Learning

The ability to learn large-scale matrices from few observed entries is important in myriad applications including imputing latencies between hosts in a communication network, expression levels of genes under various drugs, and user ratings for movies. This goal is feasible since the data generating system typically has limited degrees of freedom, and by leveraging the underlying subspace characterizing the data, we can hope to minimize the number of entries needed. Most recent work on this problem focuses on random queries. However, in many of these applications, one can employ active queries that use judicious feedback-driven choice of which entries to observe to minimize network traffic, experimental cost or user effort needed. Compressive queries offer another alternative, where only linear sketches of the data need to be observed and stored. I will present recent work from my group that demonstrates how active and compressive queries can enable improvements in sample, computational, memory or communication efficiency for subspace learning, as well as the ability to handle coherent rows or columns that might arise due to anomalous hosts, genes or users.

ECE Energy and Information Seminar Hosts

Pulkit Grover <pulkit@cmu.edu>
Marija Ilic <milic@ece.cmu.edu>
Soummya Kar <soummyak@ece.cmu.edu>
José Moura <moura@ece.cmu.edu>
Rohti Negi <negi@ece.cmu.edu>
Aswin Sankaranarayanan <saswin@ece.cmu.edu>

Student Coordinator

June Zhang <junez@andrew.cmu.edu>

Electrical & Computer ENGINEERING

Carnegie Mellon University