The Department of Electrical and Computer Engineering Presents:

Dr. Sohail Bahmani

Nonlinear Regression Via Convex Programming

Abstract

We consider a class of parametric regression problems where the signal is observed through random nonlinear functions with a difference of convex (DC) form. This model describes a broad subset of nonlinear regression problems that includes familiar special cases such as phase retrieval/quadratic regression and blind deconvolution/bilinear regression. Given the DC decomposition of the observation functions as well as an approximate solution, we formulate a convex program as an estimator that operates in the natural space of the signal. Our approach is computationally superior to the methods based on semidefinite/sum-of-squares relaxation---tailored for polynomial observation functions---and can compete with the non-convex methods studied in special regression problems. Furthermore, under mild moment assumptions, we derive the sample complexity of the proposed convex estimator using a PAC-Bayesian argument. We instantiate our results with bilinear regression with Gaussian factors and provide a method for constructing the required initial approximate solution

Biography

Sohail Bahmani is a postdoctoral fellow in the Department of Electrical & Computer Engineering at Georgia Tech. His research is at the interface of optimization and statistics relating to problems in machine learning, signal processing, and network analysis. He has made contributions in problems such as sparse optimization, phase retrieval, blind deconvolution, and nonlinear regression. He earned his PhD from Carnegie Mellon University in 2013, his Master's degree from Simon Fraser University in 2008, and his Bachelor's degree from Sharif University of Technology in 2006, all in Electrical Engineering.

October 4, 2019

Bourns Hall A265

11:00 a.m. - 12:00 p.m.