The Power of Nonconvex Paradigms for High-Dimensional Estimation

Demo lecture: My teaching demo will be on Binary Search Trees. The content of this demo would usually be taught in an introductory data structures or CS2 course.

Teaching statement: I am passionate about exploiting techniques with pedagogical benefits to promote active learning by inviting students to be interactive and engaged in lectures. I will briefly talk about my experience in effectively incorporated many techniques and innovations such as use of classroom response systems (clickers), flipped classroom methodologies, live-coding, pair programming, eMarking tools, two-stage exams, peer learning systems (e.g., PeerWise), online discussion boards (e.g., Piazza), and massive open online courses into my teaching. I will also briefly talk about my experience in scholarship of teaching and learning.

In--depth presentation: Statistical Relational Learning is a branch of machine learning that aims to model a joint probability distribution over relational data. Relational data consists of different types of objects where each object is characterized with a different set of attributes. The structure of relational data presents an opportunity for objects to carry additional information via their links and enables the model to show correlations among objects and their relationships. This talk focuses on learning graphical models for such data. Our approach combines the scalability and efficiency of learning in directed relational models, and the inference power and theoretical foundations of undirected relational models. We utilize Functor Bayes nets, an extension of Bayesian networks based on first order logic, for learning class-level or first-order dependencies, which model the general database statistics over attributes of linked objects and their links. We then convert the Functor Bayes net to a Markov Logic Network, which are a first order extension of Markov Random Fields, using the standard moralization procedure (marry spouses, omit edge directions). Experimental results indicate that our methods were two orders of magnitude faster, and predictive metrics were superior or competitive with state-of-the-art Markov Logic Network learners on six benchmark datasets.

Bio:
I received my Ph.D. from the School of Computing Science at Simon Fraser University (SFU) in October 2012. Currently, I am a full-time Lecturer in the Department of Computer Science at the University of British Columbia (UBC) and I have held this position since August 2013. My teaching career includes instructing 15 different offerings, with class sizes ranging from 50 to 310, of 9 distinct undergraduate courses to a total of roughly 2500 undergraduate students.