Title: General Frameworks for Bayesian Theory, Modeling and Computation

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Time & Place: Wednesday, March 1, 2017
4pm, Room 331 SMI
Cookies & Coffee @ 3:30, Rm 1210 MSC

Abstract: High dimensional statistics deals with the challenge of extracting structured information from complex model settings. Bayesian modeling strategies are so flexible in various high dimensional data analysis. The first part of the talk provides a unified approach to both Bayes high dimensional statistics and Bayes nonparametrics in a general framework of structured linear models. With a proposed two-step prior, we prove a general oracle inequality for posterior contraction under an abstract setting that allows model misspecification. The general theorem can be used to derive new results on optimal posterior contraction under many complex model settings including recent works for stochastic block model, graphon estimation and dictionary learning. It can also be used to improve upon posterior contraction results in literature including sparse linear regression and nonparametric aggregation. The second part of the talk introduces a flexible way of building Bayesian models using graphs. This allows efficient computation through deterministic EM iterations. We will discuss applications in change-point analysis and clustering analysis.