



THE UNIVERSITY OF CHICAGO

Department of Statistics
STATISTICS COLLOQUIUM

LONG NGUYEN

Department of Statistics
University of Michigan, Ann Arbor

Borrowing Strength in Hierarchical Bayes: Convergence of the Dirichlet Base Measure

MONDAY, March 4, 2013 at 4:00 PM

133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110

ABSTRACT

In this talk I will discuss the posterior concentration behavior of latent mixing measures that arise in hierarchical nonparametric Bayesian models such as the hierarchical Dirichlet processes (HDP) of Teh et al (JASA, 2006). Key to this question is the convergence of the base measure (mean measure) of a Dirichlet process, given observations associated with the random measures sampled from the Dirichlet process. Since the sampled measures serve as mixing measures for an exchangeable collection of mixture distributions, our theory also helps to quantify in a precise way the benefits of “borrowing strength” in the inference of grouped data—a heuristic argument commonly used to motivate hierarchical modeling. We show that in the HDP model, the gain of efficiency due to the Bayesian hierarchy can be dramatic, improving from a standard nonparametric rate to a parametric rate of convergence. Tools developed include transportation distances (i.e., Wasserstein distances) for nonparametric Bayesian hierarchies, the existence of tests for Dirichlet processes, and concentration properties of Dirichlet measures.

Relevant papers:

Borrowing strength in hierarchical Bayes: convergence of the Dirichlet base measure. X. Nguyen. <http://arxiv.org/abs/1301.0802>

Convergence of latent mixing measures in finite and infinite mixture models. X. Nguyen. *Annals of Statistics*, to appear. <http://arxiv.org/abs/1109.3250>

For further information and inquiries about building access for persons with disabilities, please contact Dan Moreau at 773.702.8333 or send him an email at dmoreau@galton.uchicago.edu. If you wish to subscribe to our email list, please visit the following website: <https://lists.uchicago.edu/web/arc/statseminars>.