



THE UNIVERSITY OF  
**CHICAGO**

Department of Statistics  
**STATISTICS COLLOQUIUM**

---

**XUMING HE**

Department of Statistics  
University of Michigan

**Scalable Bayesian Model Selection Methods**

**MONDAY, April 21, 2014, at 4:00 PM**

133 Eckhart Hall, 5734 S. University Avenue

*Refreshments following the seminar in Eckhart 110*

**ABSTRACT**

Bayesian model selection faces challenges both in theory and in computation when the number of potential covariates  $p$  is large. We propose a Bayesian variable selection method that adapts to both the sample size  $n$  and the number of potential covariates  $p$  with two important features. First, it has strong model selection consistency even when  $p$  is large. Second, we propose a new Gibbs sampler that does not require  $p^2$  operations in each of its iterations. In contrast with the standard Gibbs sampler which requires sampling from a  $p$  dimensional multivariate normal distribution with a non-sparse covariance matrix, our new algorithm is much more scalable to high dimensional problems, both in memory and in computational efficiency. We use logistic regression as a primary example and compare our proposed method with several leading variable selection methods through a simulation study to show that our proposed approach selects the correct model with higher probabilities than most competitors. The talk is based on ongoing work with Naveen Narisetty and Juan Shen.

---

For further information and inquiries about building access for persons with disabilities, please contact Kirsten Wellman at 773.702.8333 or send her an email at [kwellman@galton.uchicago.edu](mailto:kwellman@galton.uchicago.edu). If you wish to subscribe to our email list, please visit the following website: <https://lists.uchicago.edu/web/arc/statseminars>.