

STATISTICS COLLOQUIUM

MONDAY, OCTOBER 28, 2013

TALK: 4:15 PM — SCIENCE CENTER RM. 705

RECEPTION: 3:50 PM — SCIENCE CENTER, 7TH FLOOR

“Bayesian Inference for Logistic Models using Polya-Gamma Data Augmentation”

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ABSTRACT

We propose a new data-augmentation strategy for fully Bayesian inference in models with binomial likelihoods. The approach appeals to a new class of Polya-Gamma distributions, which are constructed in detail. A variety of examples are presented to show the versatility of the method, including logistic regression, negative binomial regression, nonlinear mixed-effects models, and spatial models for count data. In each case, our data-augmentation strategy leads to simple, effective methods for posterior inference that: (1) circumvent the need for analytic approximations, numerical integration, or Metropolis-Hastings; and (2) outperform other known data-augmentation strategies, both in ease of use and in computational efficiency. All methods, including an efficient sampler for the Polya-Gamma distribution, are implemented in the R package BayesLogit.

This is joint work with Nick Polson (Chicago) and Jesse Windle (Duke).