# THE UNIVERSITY OF CHICAGO

## Department of Statistics

## DISSERTATION PROPOSAL

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## A Spike and Slab Prior and Bayesian Variable Selection

THURSDAY, November 15, 2018, at 10:00 AM
Jones 304, 5747 S. Ellis Avenue

## ABSTRACT

A spike and slab prior has played a central role in the history of the Bayesian variable selection problem. We study several variants of the spike and slab prior, especially two cases when the spike distribution is not exactly supported at zero and the slab is represented as a mixture distribution. We start with the Bayesian variable selection model and then study more complicated models on graphs. We also propose empirical Bayes approaches to matrix factorization and topic modeling. We also apply our methods to real data from genetics, genomics, and computer science.