



The University of Chicago
Department of Statistics

Master's Thesis Presentation

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Bayesian Neural Networks and Variable Selection

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ABSTRACT

Neural networks suffer from a problem of explanation; it is very difficult to determine which variables are important. Additionally, high dimensionality leads to serious overfitting problems. Various authors have proposed Bayesian methods for neural networks. After describing the attempts of others, this paper proposes an alternative. The new model, based on mixture models, adds a switching variable to each predictor inside each node. If the switch is on, the coefficient takes a typical Gaussian distribution, but when off, the coefficient is shrunk to a very small value. The nearly zero coefficients reduce overfitting, while the switches provide evidence of importance.

This talk will describe history, past approaches by others, the new model, and an example of its work.