THE UNIVERSITY OF CHICAGO | **DEPARTMENT OF STATISTICS**

MASTER'S THESIS PRESENTATION

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Bayesian Inference using Deep Learning

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Jones Laboratory, Room 303

ABSTRACT

Bayesian inference is a widely used statistical technique, but it can be challenging to apply in high-dimensional problems. In this paper, we propose a new approach that leverages deep learning to make Bayesian inference more accessible in such cases. Specifically, we use neural networks to learn direct mappings from data to parameters' posterior mean or posterior quantiles using different loss functions. To train the networks, we generate datasets based on the probability process. Our method is simple, efficient, and can handle stochastic simulators with intractable likelihoods. We validate our approach through simulation studies, which show that it performs well in both low-dimensional and high-dimensional cases. Overall, our work provides a promising new avenue for making Bayesian inference more accessible in complex problems.