



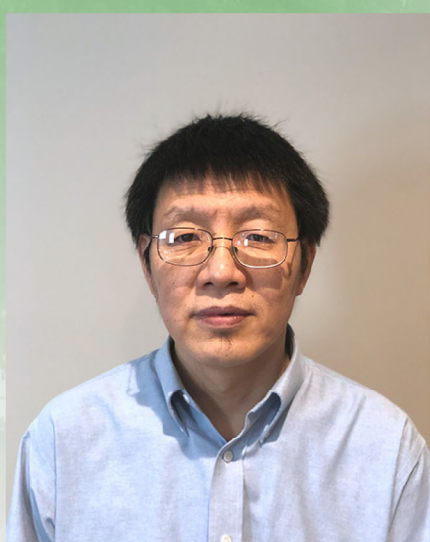
香港中文大學統計學系

Department of Statistics

THE CHINESE UNIVERSITY OF HONG KONG

DISTINGUISHED LECTURE

A Stochastic Neural Network Bridging from Linear Models to Deep Learning



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Abstract

We develop a new type of stochastic neural network (StoNet), which is formulated as a composition of many simple linear/logistic regression models and includes the conventional deep neural network as a limiting case. The StoNet falls into the framework of statistical modeling, which does not only allow us to address many fundamental issues in deep learning, such as structure interpretability and uncertainty quantification, but also provides with us a platform for transferring the theory and methods developed for linear models to deep learning. With the StoNet, we demonstrate the transferability of sparse learning theory from linear models to deep neural networks. We also showcase the integration of reproducing kernel methods into deep neural networks to enhance their training and prediction performance. Additionally, we show how to use the Stonet to handle some special types of data, such as those with missing values or measurement errors. Lastly, we demonstrate how to use the StoNet to perform nonlinear sufficient dimension reduction and causal inference for high-dimensional data. This talk is based on the joint works with Yan Sun, Siqi Liang, and Yaxin Fang.

★★★★★ All are welcome ★★★★★

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