



THE UNIVERSITY OF  
**CHICAGO**

Department of Statistics

MASTER'S THESIS PRESENTATION

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Online Covariance Matrix Estimation in Stochastic Gradient  
Descent with Application in Music Recognition

THURSDAY, February 25, 2021, at 4:30 PM  
ZOOM Meeting

ABSTRACT

Deep learning techniques has long been applied in speech & music recognition and have been reaching the state-of-art result. However, the explainability and interpretability of the neural network methods have long been a concern of both academia and industry. To address this issue, we applied online covariance matrix estimation algorithm in neural networks and experimented on music recognition tasks. We estimated the covariance matrix and conducted statistical inference for learned parameters in our multi-layer perceptron neural network model. We also gave explanations of how this method provides a straight-forward evaluation of feature importance in neural networks.