



THE UNIVERSITY OF  
**CHICAGO**

Department of Statistics

DISSERTATION PROPOSAL

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GREGORY NAISAT

Department of Statistics  
The University of Chicago

Application of Algebra and Topology for the Study of Neural  
Networks

THURSDAY, January 10, 2019, at 12:00 PM  
Jones 304, 5747 S. Ellis Avenue

ABSTRACT

I'm interested in the application of non-standard tools from algebra and applied topology to machine learning, currently focusing on neural networks. In this presentation, I outline a theoretical and empirical analysis of feedforward neural networks using tropical algebra and persistent homology. Among other things, we show how examining neural networks through the lens of those two disciplines yields insights into data processing within the network and their expressivity.