Department of Statistics
STATISTICS COLLOQUIUM

Joint seminar with the Committee on Computational and Applied Mathematics (CCAM)

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Mathematics of Deep Neural Networks

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Jones 303, 5747 S. Ellis Avenue

ABSTRACT

Neural networks are remarkable families of non-linear functions that form the backbone for state-of-the-art algorithms in tasks from computer vision (self-driving cars), natural language processing (Google Translate) and reinforcement learning (AlphaGo). After giving a precise definition of what neural networks are, I will explain how important practical questions about their complexity, stability, and optimization can be recast in mathematical terms. The problems that arise are typically statistical/probabilistic in nature. I will focus on several such questions I have studied recently involving the complexity of random hyperplane arrangements and the spectral theory of products of large random matrices.