Stanford University
Department of Statistics

DEPARTMENTAL SEMINAR

4:30pm, Tuesday, June 25, 2019
Sloan Mathematics Center Room 380C
Refreshments served at 4pm in Sequoia Lounge.

Speaker:  Tengyu Ma, Stanford Statistics and Computer Science

Title:  Data-dependent Regularization and Sample Complexity
of Deep Neural Networks

Abstract:
In this talk, we study the regularization for deep learning. First, we show that for a
simple data distribution, training neural network with an $l_2$ regularization has provably
better sample complexity than the Kernel method with random feature kernel or the neural
tangent kernel (NTK). Second, we improve the sample complexity bounds of deep neural
networks by introducing a complexity measure of the hypothesis that depends on the
training data. Adding the complexity measure as a regularizer also leads to empirically
better generalization performance.

This is based on joint works with Colin Wei, Jason Lee, and Qiang Liu: arxiv.org/abs/
1810.05369; arxiv.org/abs/1905.03684.