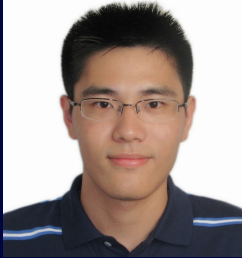# Department of Applied and Computational Mathematics and Statistics Colloquium

Yun Yang

University of Illinois, Urbana -Champaign

Implicit estimation of high-dimensional distributions using generative models

The estimation of distributions of complex objects from high-dimensional data with low-dimensional structures is an important topic in statistics and machine learning. Deep generative models achieve this by encoding and decoding data to generate synthetic realistic images and texts. A key aspect of these models is the extraction of low-dimensional latent features, assuming data lies on a low-dimensional manifold. We study this by developing a minimax framework for distribution estimation on unknown submanifolds with smoothness assumptions on the target distribution and the manifold. The framework highlights how problem characteristics, such as intrinsic dimensionality and smoothness, impact the limits of high-dimensional distribution estimation. Our estimator, which is a mixture of locally fitted generative models, is motivated by differential geometry techniques and covers cases where the data manifold lacks a global parametrization.

Mon, Apr 24, 2023
3:45 – 4:45 PM
127 Hayes-Healy Center

Colloquium Tea – 3:15 PM in 101A Crowley Hall