



THE UNIVERSITY OF
CHICAGO

Computational and Applied Mathematics
&
Statistics Student Seminar

JIAHENG CHEN

Committee on Computational and Applied Mathematics (CCAM)
The University of Chicago

“Covariance Operator Estimation in the Small Lengthscale Regime”

TUESDAY, October 10, 2023, 12:30-1:30 pm
Jones 303, 5747 S. Ellis Avenue

ABSTRACT

Covariance matrix and covariance operator estimation are fundamental tasks in statistics and play an important role in many branches of science and engineering. In this talk, we will focus on covariance operator estimation via thresholding. For random fields with approximately sparse covariance operators, we establish non-asymptotic bounds on the estimation error in terms of the sparsity level of the covariance and the expected supremum of the field. We prove that thresholded estimators enjoy an exponential improvement on the sample complexity compared with the standard sample covariance estimator if the field has a small correlation lengthscale. As an application of the theory, we study thresholded estimation of covariance operators within ensemble Kalman methods.