# THE UNIVERSITY OF GEORGIA
# DEPARTMENT OF STATISTICS

# Colloquium Series


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**4:00 PM, Thursday, March 24, 2022**
**In Person**

## Recent Development of Rank-Constrained and Distributed Statistical Learning


In this talk, I will present two recent works on rank-constrained least squares and distributed statistical learning respectively. The first part of the talk highlights a near optimal in-sample prediction error bound for the rank-constrained least squares estimator with no assumption on the design matrix. Lying at the heart of the proof is a covering number bound for the family of projection operators corresponding to the subspaces spanned by the design. By leveraging this complexity result, we perform a power analysis for a permutation test on the existence of a low-rank signal under the high-dimensional trace regression model. The second part of the talk proposes a new one-shot distributed learning algorithm through refitting Bootstrap samples from local models, which we refer to as ReBoot. Given that the full sample is split into m subsamples of size n, we show that ReBoot yields bias of order (1 / n ^ 2) under generalized linear models. This bias rate is sharper than that of vanilla or subsampled averaging of the local MLEs. Simulation and real data analysis both demonstrate the superior statistical accuracy of ReBoot over competing methods including Communication-efficient Surrogate Likelihood (CSL) and Federated Averaging (FedAvg).