



# Department of Statistics

UNIVERSITY OF GEORGIA

## Colloquium Series

### **Robust Recovery of the Central Subspace for Regression Using the Influence Function of the Renyi Divergence**

10/3/2024

When and Where:

**4:00 PM – 5:00PM**

**Room 204 Caldwell Hall**

#### Abstract:

A considerable amount of research in the literature has focused on quantifying the effect of extreme observations on classical methods for estimating the Central Subspace (CS) for regression through the study of influence functions and their sample estimates. Alternatively, a method that is inherently robust to data contamination is also important and desirable for the increased reliability in the estimation of the CS without relying on the identification and removal of influential values. To this end, we develop a new method that is innately resistant to outlying observations in recovering a dimension reduction subspace for regression based on the Renyi divergence. In addition to deriving the theoretical Influence Function (IF), the Sample Influence Function (SIF) values are directly utilized to provide new powerful and efficient methods for both estimating the dimension of the CS and selecting an optimal level of the tuning parameter to decrease the impact of extreme observations. The model-free approach is detailed theoretically, its performance investigated through simulation, and the application in practice is demonstrated through a real data analysis.

**TN Sriram**



#### About the Speaker:

Dr. T. N. Sriram is a Professor in the Department of Statistics at the University of Georgia. He served as the Interim Head of Statistics (2016-18) and as Head of Statistics (2018-2024). His research interests are Sequential Inference, bootstrap methods, robust methods in mixture models, dimension reduction, and multivariate association studies. He is a Fellow of the American Statistical Association, the recipient of the 2015 Abraham Wald Prize in Sequential Analysis, and 2004 Special Sandy Beaver Teaching Award. His research has been funded by NSA and NSF. He has served on the editorial boards in Statistics and Probability Letters, Sequential Analysis, and Journal of Indian Statistical Association, and served as the Managing Editor of all five IMS journals and as a co-editor of a Springer Festschrift and a special issue of Journal of Time Series Analysis.