THE UNIVERSITY OF GEORGIA
DEPARTMENT OF STATISTICS

UGA/Clemson

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Thursday, September 28, 2023 - 4:00pm

Location | Brooks Hall, Room 0145

Registration Fee: *$15 for Statistics Club Members, $25 for non-members*

Bayesian and Machine Learning Frameworks for Studying Climate Anomalies and Social Conflicts

Climate change stands to have a profound impact on human society, and on political and other conflicts in particular. However, the existing literature on understanding the relation between climate change and societal conflicts has often been criticized for using data that suffer from sampling and other biases, often resulting from being too narrowly focused on a small region of space or a small set of events. These studies have likewise been critiqued for not using suitable statistical tools that address spatio-temporal dependencies, obtain probabilistic uncertainty quantification, and lead to consistent statistical inferences. We first propose a Bayesian framework to address these challenges. Our results exhibit considerably nuanced relationships between temperature deviations and social conflicts that have not been noticed in previous studies. Methodologically, the proposed Bayesian framework can help social scientists explore similar domains involving large-scale spatial and temporal dependencies. Next, we propose a graph neural network-based extension of this Bayesian model. Statistical inference and uncertainty quantification in the graph neural network are discussed.

· About the Speaker ·

Dr. Snigdhansu (Ansu) Chatterjee is Professor in the School of Statistics at the University of Minnesota, and the Director of the Institute for Research in Statistics and its Applications (IRSA, http://irsa.stat.umn.edu/), an inter-disciplinary data science institute at the University of Minnesota, and a Data Scholar with the National Institutes of Health (NIH). He is the incoming Sinha Ennovate Endowed Chair Professor at the University of Maryland at Baltimore County. He has published in top-tier statistics journals including the Annals of Statistics, Annals of Applied Statistics and in the top-tier peer-reviewed computer science conferences and journals in machine learning, artificial intelligence and data mining, including the International Conference on Machine Learning, SIAM International Conference on Data Mining. He is currently the editor of the journal Sankhya, the subject area chair for AISTATS, and serves on the editorial boards of several other journals in statistics, machine learning, and interdisciplinary data sciences and in program committees of several peer-reviewed machine learning conferences. His research interests include statistical foundations of data sciences, high dimensional data geometry, Bayesian statistics, resampling methods, small area and survey techniques and applications of data sciences in multiple domains including precision medicine and climate change and its effects.

THE UGA/CLEMSON JOINT SEMINAR:

Since the 1970's the University of Georgia Department of Statistics and the Clemson University Mathematical Sciences Department have organized the annual UGA/Clemson Joint Seminar which alternates between Athens and Clemson each year.

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