Indian Statistical Institute

Applied Statistics Unit

SEMINAR NOTICE

Speaker: Moulinath Banerjee, University of Michigan, Ann Arbor

Title: Likelihood Free Learning of Spatiotemporal Hawkes Processes

Date: 02 January, 2024

Time: 16:15 PM

Venue: ASU Seminar Room

Online Platform: Google Meet (https://meet.google.com/bja-kqbp-rkc)

Abstract: Hawkes Processes are quite popular for analyzing spatiotemporal data with triggering effects and have been used as a tool for algorithmic threat detection. However, in real applications, complete data on sample paths are usually unavailable (e.g. unreported crime), whilst (estimates of) missing rates may be known. As the intensity function of a Hawkes process depends on past events, this makes the use of likelihood based methods like EM essentially infeasible. On the other hand, MDE (minimum distance estimates) based on Wasserstein distances are readily computable using GAN training, as samples from a Hawkes process with a fixed set of parameters can be readily generated. We illustrate the use of such MDE estimates to learn the parameters of Hawkes processes and present applications to predictive policing. We also investigate the theoretical properties of the estimators by invoking recent work on entropy regularized optimal transport theory.

This is joint work with Pramit Das and Yuekai Sun.

All are invited to attend.