भारतीय प्रबंध संस्थान बेंगलूर
INDIAN INSTITUTE OF MANAGEMENT
BANGALORE

The Decision Sciences Area at IIM Bangalore welcomes you to a webinar, titled:

‘Nonparametric Empirical Bayes Estimation On Heterogeneous Data’

by

Dr. Trambak Banerjee

Date: 6th October, 2021

Time: 6:30 p.m. to 7:30 p.m.

Abstract:

The simultaneous estimation of many parameters based on data collected from corresponding studies is a key research problem that has received renewed attention in the high-dimensional setting. Many practical situations involve heterogeneous data where heterogeneity is captured by a nuisance parameter. Effectively pooling information across samples while correctly accounting for heterogeneity presents a significant challenge in large-scale estimation problems. We address this issue by introducing the “Nonparametric Empirical-Bayes Structural Tweedie” (NEST) estimator, which efficiently estimates the unknown effect sizes and properly adjusts for heterogeneity via a generalized version of Tweedie’s formula. For the normal means problem, NEST simultaneously handles the two main selection biases introduced by heterogeneity: one, the selection bias in the mean, which cannot be effectively corrected without also correcting for, two, selection bias in the variance. Our theoretical results show that NEST has strong asymptotic properties without requiring explicit assumptions about the prior. Simulation studies show that NEST outperforms competing methods, with substantial efficiency gains in many settings. The proposed method is demonstrated on estimating the batting averages of baseball players and Sharpe ratios of mutual fund returns.