

Indian Statistical Institute

Applied Statistics Unit

SEMINAR NOTICE

Speaker: Sayantan Paul

Title: Consistent Group Selection Using Global-Local Shrinkage Priors in High-Dimensional Situation

Date: 30 January, 2024

Time: 16:15 PM

Online Platform: Google Meet (meet.google.com/rne-gmsy-nkj)

Abstract: In this article, we consider the problem of model selection in a sparse high-dimensional regression framework when grouping structure is inherent within the regressors, and the proportion of truly active groups is small as the sample size grows to infinity. Using a hierarchical Bayesian framework, we model the unknown regression coefficients by a very broad class of one-group shrinkage priors with heavy tails. We propose a half-thresholding (HT) rule based on the aforesaid class of heavy-tailed one-group shrinkage priors which generalizes the half-thresholding (HT) rule proposed by Tang et al. (2018). For the theoretical development of this paper, we consider both scenarios when the corresponding global shrinkage parameter is treated as a tuning parameter, and when it is replaced with an empirical Bayes estimator. Under the assumption of block-orthogonal designs, it is theoretically shown that our proposed half-thresholding (HT) rule enjoys both variable selection consistency, and optimal rate of estimation simultaneously. The superior performance of our proposed empirical Bayes and full Bayes group selection methods as compared to some existing methods in the literature is demonstrated through simulated datasets. Our simulation study indicates that the proposed thresholding rule can be extended beyond block-orthogonal designs, and yield results comparable to those of Yang and Narisetty (2020), which is regarded as the 'gold standard' in such contexts.

All are invited to attend.