Seminar

Title：Model Averaging for High-dimensional Linear Regression Models with Dependent Observations

Speaker：Mr. Ting-Hung Yu

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Time：14:00～15:00, Wednesday, July 13, 2022

Place：Auditorium, B1F, Institute of Statistical Science, AS

Abstract

Averaging several informative models to make a better prediction has been a long-standing research area in statistics. However, there are only a few results in the high-dimensional statistics literature. In this talk, we will propose a two-stage procedure, named OGA+HDMMA, to perform the model averaging for gaining prediction efficiency in using high-dimensional linear regression models with dependent observations. We first introduce the orthogonal greedy algorithm (OGA) to screen out the nested sets of signal variables from high-dimensional data and construct nested high-dimensional linear regression models accordingly. In the second stage, we devise the high-dimensional Mallow model averaging (HDMMA) criteria to determine the weight for averaging those nested high-dimensional linear regression models found in the first stage. We further analyze rates of convergence of prediction error for the averaging model under different sparsity conditions. Our contribution is threefold. First, we show that our procedure can achieve optimal convergence rates of prediction error discussed in Ing (AoS, 2020). Second, simulation results show that the out-sample prediction of OGA+HDMMA performs favorably than the MCV method proposed in Ando and Li (JASA, 2014), especially when the covariates are highly correlated or possess time-series effects. Third, the finite sample out-sample prediction of OGA+HDMMA performs comparably or even better than many well-known high-dimensional variables selection methods in some scenarios.

※ Tea reception starts at 15:00.
※ Online live streaming through Webex will be available.