



香港中文大學統計學系

Department of Statistics
THE CHINESE UNIVERSITY OF HONG KONG

SEMINAR

DEPARTMENT OF STATISTICS

THE CHINESE UNIVERSITY OF HONG KONG

Statistical Inference for Nonlinear Regression Models with High-Dimensional Covariates

INVITED SPEAKER

Bin Nan

Chancellor's Professor

Department of Statistics

University of California-Irvine

TIME

November 07, 2023 (Tue) · 2:30 pm - 3:30 pm

VENUE

LSK LT6 · Lee Shau Kee Building LT6 · CUHK

ABSTRACT

For statistical inference on regression models with large numbers of covariates, the existing literature on debiased lasso typically makes sparsity assumptions on the inverse of the Fisher information matrix. Such assumptions, however, are often violated particularly for nonlinear regression models such as generalized linear models, leading to biased estimates with under-coverage confidence intervals. We propose to tackle this problem in two different situations: (1) When the number of covariates p increases with the sample size n , but less than n , we modify the debiased lasso approach by directly inverting the information matrix without posing sparse matrix assumptions; (2) When $p > n$, we implement the sample splitting method where we select a submodel via lasso using part of the original data and then fit the selected model via the debiased method in (1) using the remaining data. We establish asymptotic results for the estimated regression coefficients. As demonstrated by extensive simulations, our proposed methods provide consistent estimates and confidence intervals with nominal coverage probabilities. The utility of the methods is further demonstrated by real data examples. This is joint work with Omar Vazquez, Lu Xia and Yi Li.