

**On Distribution Weighted Partial Least
Squares With Diverging Number of
Highly Correlated Predictors**

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School of Physical and Mathematical Sciences

Because highly correlated data arise from many scientific fields, in this talk we investigate parameter estimation in a semi-parametric regression model with diverging number of predictors that are highly correlated. To this end, we first develop a distribution weighted least squares estimator (DWLSE) that can recover directions in central subspace (CS), then use DWLSE as a seed vector and project it onto a Krylov space by partial least squares to avoid computing the inversion of the covariance of predictors. Thus, such a distribution weighted partial least squares (DWPLS) can handle the cases with high-dimensional and highly correlated predictors. Furthermore, we suggest an iterative algorithm for obtaining a better initial value before implementing PLS. We also propose a BIC type criterion to estimate the dimension of the Krylov space in the PLS procedure. Illustrative examples by a real data set and comprehensive simulations demonstrate that the method is robust to non-ellipticity, and works well even in “small n , large p ” problems.

Speaker Biography

Dr. Zhu received his undergraduate education at Anhui University in 1982 and obtained his doctorate from Chinese Academy of Sciences in 1990. Dr. Zhu’s research interests span many areas, including high-dimensional data analysis, time series, non/semi-parametric statistics, Monte Carlo methods, empirical process theory, biostatistics and Bioinformatics. Dr. Zhu won the Humboldt Research Award (2000) of Germany, a prestigious international award for all disciplines and all countries in the world. He is a Fellow of The American Statistical Association, Institute of Mathematical Statistics and an elected member of International Statistical Institute.

Host: Prof. Lian Heng, Division of Mathematical Sciences, School of Physical and Mathematical Sciences

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