# Efficient Estimation in Multivariate Baseline Proportional Hazards Model with Dimension Reduction

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## Abstract

In this talk, a nested family of multivariate baseline proportional hazards models is considered for analyzing survival data. It maintains the practically desirable hazard-ratio interpretation of target parameters as in Cox proportional hazards model, while allowing the control of multi-dimensional covariates in a nonparametric manner. The model also allows data-adaptive dimension reduction to reduce the effect of curse of dimensionality. Under the proposed model, we propose a valid procedure to perform the partial sufficient dimension reduction. Further, under the selected structural dimension, we characterize the semiparametric efficiency bound for parameters of interest. We also propose a pseudo maximum likelihood estimator and show that it is semiparametric efficient.