



The Hong Kong University of Science and Technology

Department of Mathematics

Seminar on Statistics and Data Science

**Counting Process Based Dimension Reduction
Methods for Censored Outcomes**

By

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Abstract

We propose a class of dimension reduction methods for right-censored survival data using the counting process representation of the failure process. Semiparametric estimating equations are constructed to estimate the dimension reduction subspace for the failure time model. Our proposed method addresses two fundamental limitations of existing approaches. First, using the counting process formulation, it does not require estimation of the censoring distribution to compensate for the bias in estimating the dimension reduction subspace. Second, the nonparametric part in the estimating equations adapts to the structural dimension, so the approach circumvents the curse of dimensionality. Asymptotic normality is established for the estimators. The proposed method is solved using a fast first-order optimization approach in the Stiefel manifold. We further propose a computationally efficient approach that simplifies the counting process formulation and requires only a singular value decomposition to estimate the dimension reduction subspace. The proposed method is implemented in the R package "orthoDr", available on CRAN.

Date: Wednesday, 19 December 2018

Time: 3:00p.m.-4:00p.m.

**Venue: Room 4582 (lifts 27 & 28),
Academic Building, HKUST**

All are welcome!