



統計科學研究所

INSTITUTE OF
STATISTICAL SCIENCE



統計所學術演講



中研院統計所

學術演講

講 題：Deep Learning for Partial Linear Cox Model

講 者：Prof. Jane-Ling Wang (王建玲 教授)

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時 間：2023年4月12日(星期三)，15:30-16:30

地 點：統計所B1演講廳

Abstract

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While deep learning approaches to survival data have demonstrated empirical success in applications, most of these methods are difficult to interpret and mathematical understanding of them is lacking. This paper studies the partially linear Cox model, where the nonlinear component of the model is implemented using a deep neural network. The proposed approach is flexible and able to circumvent the curse of dimensionality, yet it facilitates interpretability of the effects of treatment covariates on survival. We establish asymptotic theories of maximum partial likelihood estimators and show that our nonparametric deep neural network estimator achieves the minimax optimal rate of convergence (up to a poly-logarithmic factor). Moreover, we prove that the corresponding finite-dimensional estimator for treatment covariate effects is \sqrt{n} -consistent, asymptotically normal, and attains semiparametric efficiency. Extensive simulation studies and analyses of two real survival datasets show the proposed estimator produces confidence intervals with superior coverage as well as survival time predictions with superior concordance to actual survival times.

※ 實體與線上視訊同步進行。

※ 茶 會：上午15：10開始。