北京理工大学

数学与统计学院学术报告

Orthogonalized Score Tests for Conditional Variable Significance in Deep Partial Linear Cox Models

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摘　要： Conditional statistical inference for high-dimensional survival data remains a fundamental yet challenging problem, particularly when the effects of nuisance variables are complex and difficult to specify parametrically. In this paper, we propose a Deep Partial Linear Cox model that leverages neural networks to flexibly capture nonlinear nuisance effects while preserving interpretability for variables of primary interest. To test the conditional significance of high-dimensional variable sets within this framework, we develop an orthogonalized score test that effectively removes the influence of estimated nuisance components, thereby achieving valid inference in the presence of complex data dependencies. Our method accommodates settings where the number of tested parameters exceeds the sample size, without imposing sparsity assumptions. We establish the limiting null distribution of the proposed test statistic. Extensive numerical studies and an application to the TCGA breast cancer dataset demonstrate the superior performance and practical utility of our approach.

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