統計科學研究所
INSTITUTE OF STATISTICAL SCIENCE

SEMINAR STATAS

Promotion Seminar

Title：Improved Semiparametric Estimation of the Proportional Rate Model with Recurrent Event Data

Speaker：Dr. Ming-Yueh Huang (黃名鉞 博士)
(Institute of Statistical Science, Academia Sinica)

Time：10:30 ~ 12:00, Monday, Apr. 24, 2023

Place：Auditorium, B1F, Institute of Statistical Science

Abstract

The pseudo-partial likelihood method, known for its robustness, marginal interpretations, and ease of implementation, has become the default method for analyzing recurrent event data using Cox-type proportional rate models, as introduced in the seminal papers by Pepe & Cai (1993) and Lin et al. (2000). However, the pseudo-partial score function's construction does not account for dependency among recurrent events, leading to potential inefficiency. In this study, we explore the asymptotic efficiency of weighted pseudo-partial likelihood estimation, demonstrating that the optimal weight function depends on the unknown variance-covariance process of the recurrent event process and may lack a closed-form expression. Therefore, we propose combining a set of pre-specified weighted pseudo-partial score equations using the generalized method of moments and empirical likelihood estimation, rather than determining optimal weights. Our findings indicate that significant efficiency improvements can be readily achieved without introducing additional model assumptions. Furthermore, the proposed estimation methods can be executed using existing software. Both theoretical and numerical analyses reveal that the empirical likelihood estimator is more desirable than the generalized method of moments estimator when the sample size is sufficiently large. We present an analysis of readmission risk in colorectal cancer patients to exemplify the application of the proposed methodology. This is a joint work with Prof. Chiung-Yu Huang in University of California, San Francisco.

※Online live streaming through Cisco Webex will be available.

※ The tea reception will be held at 10:10.