中央研究院統計科學研究所

學 術 演 講

講 題： A new joint model of a longitudinal outcome and a competing risks time-to-event outcome

演 講 人： Prof. Gang Li

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時 間： 2024-06-12(Wed.) 15:00~15:50

地 點： Auditorium, B1F, Institute of Statistical Science；The tea reception will be held at 14:40.

備 註： Online live streaming through Cisco Webex will be available.

Abstract

Recent discoveries have emphasized the importance of within-subject (WS) visit-to-visit variability of longitudinal biomarkers as significant risk factors for health outcomes. This talk introduces a new joint model that incorporates a longitudinal biomarker with heterogeneous WS variability and a competing risks time-to-event outcome. The proposed model provides a valuable framework for testing heterogeneity in WS variability, exploring the association between WS variability and survival outcomes, and enabling dynamic prediction of survival by considering both the individual mean and WS variability of a biomarker. An expectation-maximization algorithm is derived for semiparametric maximum likelihood estimation, along with a profile-likelihood method for standard error estimation and inference. Moreover, we develop efficient algorithms tailored for biobank-scale data with tens of thousands of subjects. We demonstrate the utility and advantages of our approach over traditional joint models through simulations and some real world data.

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