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：Semiparametric Predictive Inference for Failure Data Using First-hitting-time Threshold Regression

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時　間：2022年12月26日(星期一)，16:00-17:30

地　點：統計所B1演講廳

Abstract

The progression of disease for an individual can be described as a stochastic process. The individual experiences a failure event when the disease path first reaches a critical disease level. This failure event is a first hitting time. When the context involves explanatory variables, the regression structures is known as threshold regression. To date, most applications of threshold regression have been based on parametric families of stochastic processes. This paper presents a semiparametric form of threshold regression that requires the stochastic process to have only one key property, namely, stationary independent increments. The basic data element required by the model is a pair of readings representing the observed change in time and the observed change in disease level, arising from either a failure event or survival of the individual to the end of the data record. An extension is presented for applications where the underlying disease process is unobservable, but component covariate processes are available to construct a surrogate disease process. Threshold regression, used in combination with a data technique called Markov decomposition, allows the methods to handle longitudinal time-to-event data by uncoupling a longitudinal record into a sequence of single records. Computational aspects of the methods are straightforward. We applied the methods to data from The Osteoarthritis Initiative (OAI) study are presented to demonstrate its practical use.

This is a joint work with Dr. George A. Whitmore of McGill University.

※ 實體與線上視訊同步進行。　　※ 茶　會：下午3：40開始。