Public Abstract

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Title:Semiparametric Analysis of Panel Count Data

Panel count data often arise in long term studies that concern occurrence rates of certain recurrent events. In such studies, each subject is observed only at finite discrete time points instead of continuously, and only the number of events that occurred between observation times is known. By multivariate panel count data, we mean that more than one type of recurrent events are of interest. Fields that produce such data include epidemiological studies, medical follow-up studies, reliability studies, and tumorigenicity experiments. This dissertation studies three research problems related to regression analysis of univariate and multivariate panel count data. Semiparametric regression models and estimation procedures are presented for the situations where observation times or both observation and follow-up times are related with the recurrent events of interest. Their performances are evaluated through simulation studies for practical situations. In addition, the proposed methods are illustrated by application to two data sets from bladder tumor and psoriatic arthritis studies.