

Modeling and Correlation Estimation for Bivariate Recurrent Event Processes

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Abstract: Bivariate or multivariate recurrent event data are often collected in longitudinal studies as the primary outcome measurements for research. We consider modeling and correlation structure for bivariate recurrent events, where the association between two types of recurrent events is characterized by frailty processes and hence allows for time-dependent association. This forms a contrast with those conventional models for bivariate recurrent events where the association is characterized solely by a baseline frailty variable. Composite likelihood approaches are developed to estimate parameters in the joint rate models in semiparametric settings. The proposed models and methods can be used to identify biomarkers or risk factors for recurrent events that could be used to tailor preventive strategies and treatment plans. An analysis of stroke data is presented to illustrate the applicability of the proposed methods.