Hazard Models and Censored Data

Chair: Pierre-Jérôme Bergeron (University of Ottawa)

XIN XIN, University of Guelph
Ties Between Event Times and Jump Times in the Cox Model

The partial likelihood of the Cox-PH model is affected by ties between event times and moments where discrete time-varying covariates change. The default behaviour of current softwares will be discussed and proposals for simple methods for dealing with such ties will be outlined. Results of a simulation study show that current methods found in commonly used software can lead to biased estimates of the regression coefficient of a binary time-varying covariate and that two proposed methods reduce estimation bias. Illustrations of these methods will be presented.

THARSHANNA NADARAJAH, Memorial University of Newfoundland
Penalized Empirical Likelihood Based Variable Selection for Cox's Proportional Hazards Model

Variable selection is an important problem in survival analysis. In practice, an investigator may take many covariates as potential risk factors at the initial stage of the modeling and the selection of significant risk factors plays a crucial role. We propose a nonparametric version of the penalized-likelihood variable selection method for Cox's proportional hazards model with right censoring, by replacing the parametric likelihood by the empirical likelihood. Our simulation studies shows that our proposed method is consistent and when a parametric model is available its performance is comparable with existing methods.

KATRINA TOMANELLI, University of Windsor
Improved Estimation of Aalen's Additive Hazards Model

We consider Aalen's additive hazards model for censored data under the assumption that the time-dependent regression coefficients restricted to a prior subspace. If the restriction information is uncertain, then it is unclear whether to employ the restricted or the unrestricted least squared estimators (LSEs). We propose a class of Stein-type estimators of the parameters which combine the restricted and unrestricted LSEs. We show both analytically and by simulations that such estimators have relatively superior performance. We illustrate the proposed methodology by using data from a clinical trial on primary biliary cirrhosis of the liver.

PORDELI POONEH, University of Calgary
Estimation in Partially Linear Single-index Additive Hazards Regression with Current Status data

We propose a partially linear single-index additive hazards regression model for current status data. The linear covariates are time-dependent and the nonlinear covariates are time-independent. The proposed model can model both linear and nonlinear covariate effects on the hazard and it avoids "curse of dimensionality". We use B-splines to model the nonparametric covariate functions. Asymptotic properties of the estimators are derived using the theory of counting processes. Simulation studies are presented to compare the new method with the standard linear additive hazards regression model.

XUEWEN LU, University of Calgary
Variable Selection for Censored Partially Linear Single-Index Models

We consider variable selection for partially linear single-index models with randomly censored samples. We adopt a weighted profile least-squares procedure for estimation of regression coefficients. We invoke the smoothly clipped absolute deviation penalty (SCAD) approach for simultaneous variable selection and estimation. We show that the resultant SCAD estimators are consistent and hold the oracle property. We modify the tuning parameter selector BIC for the complete data case and show that the modified BIC is able to identify the true model consistently. We present simulation results for illustration.