Semiparametric estimation in an accelerated failure model with time-dependent covariates

Eric V. Slud

Mathematics Department
University of Maryland, College Park

E-Mail: evs@math.umd.edu

Abstract: Semiparametric estimation is studied in a simple model for the load-sharing and simultaneous-failure mechanisms of multiple-component systems. The model, which specifies componentwise clock speeds under various loading states as parameters but leaves the componentwise hazards completely general, has precursors in work of Cinlar (1977, 1984) and was first proposed in a preprint of the author (Slud 1996). In this paper, consistency and semiparametric efficiency of estimators within the model are proved. The estimation methodology is illustrated on simulated data.

Key Words: Accelerated failure model, dynamic reliability, modified profile likelihood, time-dependent covariates, semiparametric estimation.