Nonparametric inference in multiplicative intensity model by discrete time observation

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Abstract   This paper deals with nonparametric inference problems in the multiplicative intensity model for counting processes. We propose a Nelson–Aalen type estimator based on discrete observation. The functional asymptotic normality of the estimator is proved. The limit process is the same as that in the continuous observation case, thus the proposed estimator based on discrete observation has the same properties as the Nelson–Aalen estimator based on continuous observation. For example, the asymptotic efficiency of proposed estimator is valid based on less information than the continuous observation case. A Kaplan–Meier type estimator is also discussed. Nonparametric goodness of fit test is considered, and an asymptotically distribution free test is proposed.

Keywords   Counting process · Discrete observation · Multiplicative intensity model · Weak convergence