A PENALTY METHOD FOR NONPARAMETRIC ESTIMATION OF THE INTENSITY FUNCTION OF A COUNTING PROCESS

ANESTIS ANTONIADIS*

Department of Mathematics, U.E.R. des Sciences, University of Saint-Etienne, 23, rue du Dr Paul Michelon, 42100 Saint-Etienne, France

Abstract. Nonparametric estimators are proposed for the logarithm of the intensity function of some univariate counting processes. An Aalen multiplicative intensity model is specified for our counting process and the estimators are derived by a penalized maximum likelihood method similar to the method introduced by Silverman for probability density estimation. Asymptotic properties of the estimators, such as uniform consistency and normality, are investigated and some illustrative examples from survival theory are analyzed.

Key words and phrases: Penalized likelihood, counting processes, multiplicative intensity, censored data, martingales, Sobolev spaces, kernel estimation.