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Mohamed Chaouch, Naâmane Laïb, Elias Ould Saïd

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Nonparametric M-estimation for right censored regression model with stationary ergodic data

Mohamed Chaouch[1,*] Naâmane Laïb[2,3] and Elias Ould Saïd[4]
[1]Department of Statistics
United Arab Emirates University, UAE
[2]L.S.T.A., Université Paris VI, Paris - France
[3]EISTI, avenue du parc 95011, Cergy-Pontoise, France.
[4]ULCO, LMPA, CS: 80699 Calais - France

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Abstract

The present paper deals with a nonparametric M-estimation for right censored regression model with stationary ergodic data. Defined as an implicit function, is a kernel-type estimator of a family of robust regression is considered when the covariate take its values in $\mathbb{R}^d$ ($d \geq 1$) and the data are sampled from a *stationary ergodic process*. The strong consistency (with rate) and the asymptotic distribution of the estimator are established under mild assumptions. Moreover, a usable confidence interval is provided which does not depend on any unknown quantity. Our results hold without any mixing condition and do not require the existence of marginal densities. A comparison study based on simulated data is also provided.

Keywords: Asymptotic normality, censored data, confidence interval, ergodic data, Kaplan-Meier estimator, robust estimation, strong consistency, synthetic data.

Subject Classifications: 60F10, 62G07, 62F05, 62H15.

1 Introduction

Consider a pair (X, T) of random variables defined in $\mathbb{R}^d \times \mathbb{R}$, $d \geq 1$, where T is a variable of interest and $X = (X^1, \ldots, X^d)$ a vector of concomitant variables. In many situations, one can be interested in the regression function $m(x) = \mathbb{E}(T|X = x)$ for $x \in \mathbb{R}^d$, which allows to describe the relationship between T and X.

*corresponding author