

论文

ON B-SPLINE M-ESTIMATORS IN A SEMIPARAMETRIC REGRESSION MODEL

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摘要 This paper deals with M-estimators for a semiparametric regression model $Y=X^t\beta_0 + g_0(T) + e$, where Y is real-valued, T ranges over a nondegenerate compact interval, $X \in R^d$, e is a random error, β_0 is a d-vector of parameters to be estimated, and g_0 is an unknown smooth function whose mth derivative function satisfies a Holder condition with exponent $\nu \in (0, 1]$. A B-spline is taken to approximate g_0 , the M - estimators of β and g_0 are defined, and their convergence rates are investigated. A Monte Carlo study is carried out. It is shown that when the random errors are normally distributed the M-estimators are as good as least square esthoators; however, when the random errors are drawn from a symmetrically contaminated normal distribution the M-estimators are superior to least square estimators; and when the random errors are distributed as Cauchy distribution the M-edimators seem acceptable but the least Square estimtors behave poorly. It is proved that the B-spline M-estimators of g_0 attain the convergence rate as that of the optimal global rate of convergence for nonparametric regression, and the M-estimators of β_0 attain the convergence rate $n^{-1/2}$ under some conditions.

关键词 [semiparametric regression model, M-estim](#)

分类号

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Key words [semiparametric regression model](#) [M-estimator](#) [optical global rate of convergence](#) [B-spline function](#)

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