A CLASS OF LINEAR REGRESSION PARAMETER ESTIMATORS CONSTRUCTED BY NONPARAMETRIC ESTIMATION

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Abstract

Given a $(p + 1)$-dimensional random vector (X, Y) where f is the unknown density of X, the pararneters of the multiple linear regression function $\alpha(x) = E(Y/X = x) = x\beta$ may be estimated from a sample $\{(X_1, Y_1), ..., (X_n, Y_n)\}$ by minimizing the functional

$$\hat{\psi}(\beta) = \int \left(\hat{\alpha}_n(x) - x\beta\right)^2 \hat{f}_n(x) dx,$$

where $\hat{\alpha}_n$ and $\hat{f}_n$ may be any of a large class of nonparametric estimators of α and f. The strong consistency and asymptotic normality of the estimators so obtained are proved in this article under conditions on (X, Y) that are less restrictive than those assumed by Faraldo Roca and González Manteiga for $p = 1$. This class of estimators includes ordinary and generalized ridge regression estimators as special cases.