

Estimation of the error density in a semiparametric transformation model

Benjamin Colling · Cédric Heuchenne ·
Rawane Samb · Ingrid Van Keilegom

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Abstract Consider the semiparametric transformation model $\Lambda_{\theta_o}(Y) = m(X) + \varepsilon$, where θ_o is an unknown finite dimensional parameter, the functions Λ_{θ_o} and m are smooth, ε is independent of X , and $\mathbb{E}(\varepsilon) = 0$. We propose a kernel-type estimator of the density of the error ε , and prove its asymptotic normality. The estimated errors, which lie at the basis of this estimator, are obtained from a profile likelihood estimator of θ_o and a nonparametric kernel estimator of m . The practical performance of the proposed density estimator is evaluated in a simulation study.