

Nonparametric quantile estimation using importance sampling

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Abstract Nonparametric estimation of a quantile of a random variable $m(X)$ is considered, where $m : \mathbb{R}^d \rightarrow \mathbb{R}$ is a function which is costly to compute and X is a \mathbb{R}^d -valued random variable with a given density. An importance sampling quantile estimate of $m(X)$, which is based on a suitable estimate m_n of m , is defined, and it is shown that this estimate achieves a rate of convergence of order $\log^{1.5}(n)/n$. The finite sample size behavior of the estimate is illustrated by simulated data.

Keywords Nonparametric quantile estimation · Importance sampling · Rate of convergence

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