THE REFERENCE DENSITY METHOD FOR HIGH-ORDER KERNEL

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The theory of bandwidth choice in density estimation is developing very fast. Several methods have been recently proposed as an alternative to least squares cross-validation, the standard for years. This paper describes one of that, the reference density method.

The formula for asymptotically optimal bandwidth h_f with respect to $MISE$ is well-known. Unfortunately this formula depends on $\int \left(f^{(k)}(x)\right)^2 dx$, where f is an unknown function. The estimate of this integral is a very serious problem. One way is to use the Gaussian function as a reference density (Silverman '86, Scott '92). The presented paper is dealing with this procedure. The formula for h_f for optimal kernel of order k is known. But in the literature only the case $k = 2$ is described. This paper aims to describe the case for any even k. Therefore it can give a powerfull data-based bandwidth selector. Finally a small simulation study is included.