

Tradeoffs Between Global And Local Risks In Nonparametric Function Estimation

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Abstract

We investigate the possibility of finding multi-purpose nonparametric function estimators that are minimax rate optimal for estimating the entire function and are also minimax rate optimal for point estimation. We show that it is impossible to attain the global optimal rate of convergence as well as the local optimal rate at every point.

An inequality concerning estimation in a two parameter statistical problem plays a key role in the proof. It can be considered as a generalization of an inequality in Brown and Low (1996b). This may be of independent interest.

A particular wavelet estimator is constructed which is globally optimal and which attains the lower bound provided by our inequality.

Keywords: Besov class, constrained risk inequality, normal location-scale model, nonparametric function estimation, nonparametric regression, superefficiency, wavelets, white noise model.

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