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Recursive bias estimation for multivariate regression smoothers

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This paper presents a practical and simple fully nonparametric multivariate smoothing procedure that adapts to the underlying smoothness of the true regression function. Our estimator is easily computed by successive application of existing base smoothers (without the need of selecting an optimal smoothing parameter), such as thin-plate spline or kernel smoothers. The resulting smoother has better out of sample predictive capabilities than the underlying base smoother, or competing structurally constrained models (GAM) for small dimension ($3 < d < 8$) and moderate sample size ($n < 800$). Moreover our estimator is still useful when ($d > 10$) and to our knowledge, no other adaptive fully nonparametric regression estimator is available without constrained assumption such as additivity for example. On a real example, the Boston Housing Data, our method reduces the out of sample prediction error by 20 %. An R package ibr, available at CRAN, implements the proposed multivariate nonparametric method in R.

Submission history

Which authors of this paper are endorsers?

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