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Adaptive penalized splines for data smoothing.  (English)  Zbl 1466.62223

Summary: Data driven adaptive penalized splines are considered via the principle of constrained regression. A locally penalized vector based on the local ranges of the data is generated and added into the penalty matrix of the classical penalized splines, which remarkably improves the local adaptivity of the model for data heterogeneity. The algorithm complexity and simulations are studied. The results show that the adaptive penalized splines outperform the smoothing splines, $l_1$ trend filtering and classical penalized splines in estimating functions with inhomogeneous smoothness.

MSC:
62-08  Computational methods for problems pertaining to statistics
62G08  Nonparametric regression and quantile regression

Keywords:
nonparametric regression; data smoothing; penalized splines; adaptivity; local penalty

Software:
gss; fda (R); AdaptFitOS; SemiPar

Full Text:  DOI

References: