Hurvich, Clifford M.; **Simonoff, Jeffrey S.**

Smoothing parameter selection in nonparametric regression using an improved Akaike information criterion. (English) Zbl 0909.62039

J. R. Stat. Soc., Ser. B, Stat. Methodol. 60, No. 2, 271-293 (1998).

Summary: Many different methods have been proposed to construct nonparametric estimates of a smooth regression function, including local polynomial, (convolution) kernel and smoothing spline estimators. Each of these estimators uses a smoothing parameter to control the amount of smoothing performed on a given data set. In this paper an improved version of a criterion based on the Akaike information criterion (AIC), termed AIC_c, is derived and examined as a way to choose the smoothing parameter. Unlike plug-in methods, AIC_c can be used to choose smoothing parameters for any linear smoother, including local quadratic and smoothing spline estimators. The use of AIC_c avoids the large variability and tendency to undersmooth (compared with the actual minimizer of average squared error) seen when other 'classical' approaches (such as generalized cross-validation or the AIC) are used to choose the smoothing parameter. Monte Carlo simulations demonstrate that the AIC_c-based smoothing parameter is competitive with a plug-in method (assuming that one exists) when the plug-in method works well but also performs well when the plug-in approach fails or is unavailable.

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convolution kernel regression estimator; local polynomial regression estimator; smoothing spline regression estimator; plug-in method

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