

THEORY FOR PENALISED SPLINE REGRESSION

by

Peter Hall and J.D. Opsomer
Australian National University, Iowa State University

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ABSTRACT

Penalised spline regression is a popular new approach to smoothing, but its theoretical properties are not yet well understood. In this article, mean squared error expressions and consistency results are derived by using a white-noise model representation for the estimator. The effect of the penalty on the bias and variance of the estimator is discussed, both for general splines and for the case of polynomial splines. The penalised spline regression estimator is shown to achieve the optimal nonparametric convergence rate established by Stone (1982).