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Practical Smoothing

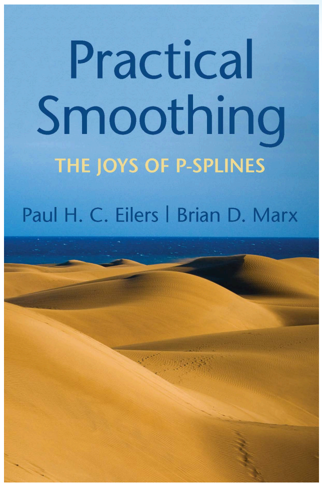
The Joys of P-splines

Paul H.C. Eilers

Erasmus Universiteit Rotterdam

Brian D. Marx

Louisiana State University



This is a practical guide to P-splines, a simple, flexible and powerful tool for smoothing. P-splines combine regression on B-splines with simple, discrete, roughness penalties. They were introduced by the authors in 1996 and have been used in many diverse applications. The regression basis makes it straightforward to handle non-normal data, like in generalized linear models. The authors demonstrate optimal smoothing, using mixed model technology and Bayesian estimation, in addition to classical tools like cross-validation and AIC, covering theory and applications with code in R. Going far beyond simple smoothing, they also show how to use P-splines for regression on signals, varying-coefficient models, quantile and expectile smoothing, and composite links for grouped data. Penalties are the crucial elements of P-splines; with proper modifications they can handle periodic and circular data as well as shape constraints. Combining penalties with tensor products of B-splines extends these attractive properties to multiple dimensions. An appendix offers a systematic comparison to other smoothers.

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'The title says it all. This is a practical book which shows how P-splines are used in an astonishingly wide range of settings. If you use P-splines already the book is indispensable; if you don't, then reading it will convince you it's time to start. Every example comes with an R-program available on the book's web-site, an important feature for the experienced user and novice alike.'
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