

Journal of Applied Probability and Statistics
Vol. 6, No. 1&2, pp. 29-46
ISOSS Publications 2012

BANDWIDTH SELECTION FOR INFINITE ORDER KERNEL DENSITY ESTIMATORS

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SUMMARY

We explore the usefulness of cross-validation as a means of smoothing parameter selection for density estimators using infinite order flat-top kernels. These estimators offer potentially rapid rates of convergence and straight-forward implementation. Cross-validation is particularly attractive in this setting because it adapts to the smoothness of the unknown density and requires few assumptions beyond those used by the estimator itself. We quantify the relationship between the performance of cross-validation, the kernel, and smoothness characteristics of the unknown density, and show that in the settings where infinite order kernels are most attractive, the relative convergence rate of the cross validated bandwidth can drop almost to 0. Theoretical results are bolstered by a simulation study.

Keywords and phrases: density estimation, bandwidth selection, cross-validation, infinite-order kernel.

AMS Classification: 62G07, 62G20