USE OF FOURIER TRANSFORMATION FOR KERNEL SMOOTHING

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The problem of bandwidth selection for non-parametric kernel regression is considered. We will follow the Nadaraya - Watson and local linear estimators especially. The circular design is assumed in this work to avoid the difficulties caused by boundary effects. Most of bandwidth selectors are based on the residual sum of squares (RSS). It is often observed in simulation studies that these selectors are biased toward undersmoothing. This leads to consideration of a procedure which stabilizes the RSS by modifying the periodogram of the observations. Simulation studies suggest that the proposed selector is much more consistent than the classical one.

References

[1] Chiu S.T. (1990) *Why bandwidth selectors tend to choose smaller bandwidths, and a remedy.* Biometrika **77**, 222 – 226.
[2] Härdle W. (1990) *Applied nonparametric regression.* Cambridge University Press, Cambridge.
[3] Koláček J. (2003) *Kernel estimation of the regression function* (in Czech). PhD-thesis.
[4] Rice J. (1984) *Bandwidth choice for nonparametric regression.* The Annals of Statistics **12**, 1215 – 1230.
[5] Wand M.P.,Jones M.C. (1995) *Kernel Smoothing.* Chapman & Hall, London.