

BOOTSTRAP BANDWIDTH SELECTION IN KERNEL DENSITY ESTIMATION FROM A CONTAMINATED SAMPLE*

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(Received November 16, 2001; revised April 14, 2003)

Abstract. In this paper we consider kernel estimation of a density when the data are contaminated by random noise. More specifically we deal with the problem of how to choose the bandwidth parameter in practice. A theoretical optimal bandwidth is defined as the minimizer of the mean integrated squared error. We propose a bootstrap procedure to estimate this optimal bandwidth, and show its consistency. These results remain valid for the case of no measurement error, and hence also summarize part of the theory of bootstrap bandwidth selection in ordinary kernel density estimation. The finite sample performance of the proposed bootstrap selection procedure is demonstrated with a simulation study. An application to a real data example illustrates the use of the method.

Key words and phrases: Bandwidth selection, bootstrap, consistency, deconvolution, errors-in-variables, kernel density estimation.

*This research was supported by ‘Projet d’Actions de Recherche Concertées’ (No. 98/03–217) from the Belgian government. Financial support from the IAP research network nr P5/24 of the Belgian State (Federal Office for Scientific, Technical and Cultural Affairs) is also gratefully acknowledged.