PROBLEMS OF AUTOMATIC DATA-DRIVEN BANDWIDTH SELECTORS FOR NONPARAMETRIC REGRESSION

JAN KOLÁČEK

Abstract

This note is concerned with the problem of automatic data-driven bandwidth selectors for nonparametric regression. Some selectors were shown to be consistent and asymptotically unbiased by Rice (1984) and Härdle, Hall & Marron (1988). However, in simulation studies, it is often observed that most selectors are biased toward undersmoothing and give smaller bandwidths more frequently than predicted by asymptotic results.This motivates us to study the causes of undersmoothing. An explanation for the difficulty is given here. For a remedy is used the Fourier transformation. This leads to the consideration of a new procedure which is simple modification of a classical selector. A simulation study suggests that the proposed selector is much more consistent than the classical one.

Keywords: bandwidth selection, Fourier transform, kernel estimation, nonparametric regression

Jan Koláček, Department of Applied Mathematics, Faculty of Science, Masaryk University, Janáčkovo nám. 2a, 662 95 Brno, Czech Republic

E-mail address: `kolacek@math.muni.cz`