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Nonparametric Tilted Density Function Estimation: A Cross-validation Criterion

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Abstract

In this paper, we propose a tilted estimator for nonparametric estimation of a density function. We use a cross-validation criterion to choose both the bandwidth and the tilted estimator parameters. We demonstrate theoretically that our proposed estimator provides a convergence rate which is strictly faster than the usual rate attained using a conventional kernel estimator with a positive kernel. We investigate the performance through both theoretical and numerical studies.

Keywords: Cross validation function, Non-parametric density function estimation, Rate of convergence, Tilted estimators

2010 MSC: 62G07, 62G20

1. Introduction

Motivation. Doosti and Hall (2016) introduced new high-order, non-parametric density estimators based on data perturbation, e.g. by tilting or data sharpening. They proposed an approach to choose the parameters to minimise the

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