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Nonparametric variance estimation in the analysis of microarray data: a measurement error approach. (English) [Zbl 1437.62408](#)

Biometrika 95, No. 2, 437-449 (2008).

Summary: We investigate the effects of measurement error on the estimation of nonparametric variance functions. We show that either ignoring measurement error or direct application of the simulation extrapolation, SIMEX, method leads to inconsistent estimators. Nevertheless, the direct SIMEX method can reduce bias relative to a naive estimator. We further propose a permutation SIMEX method that leads to consistent estimators in theory. The performance of both the SIMEX methods depends on approximations to the exact extrapolants. Simulations show that both the SIMEX methods perform better than ignoring measurement error. The methodology is illustrated using microarray data from colon cancer patients.

MSC:

[62P10](#) Applications of statistics to biology and medical sciences; meta analysis

Cited in **8** Documents

[62G08](#) Nonparametric regression and quantile regression

Keywords:

heteroscedasticity; local polynomial regression; measurement error; microarray; nonparametric regression; permutation; SIMEX; simulation-extrapolation; variance function estimation

Software:

[SemiPar](#)

Full Text: [DOI](#)