



Simultaneous inference for Berkson errors-in-variables regression under fixed design

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Abstract

In various applications of regression analysis, in addition to errors in the dependent observations also errors in the predictor variables play a substantial role and need to be incorporated in the statistical modeling process. In this paper we consider a nonparametric measurement error model of Berkson type with fixed design regressors and centered random errors, which is in contrast to much existing work in which the predictors are taken as random observations with random noise. Based on an estimator that takes the error in the predictor into account and on a suitable Gaussian approximation, we derive finite sample bounds on the coverage error of uniform confidence bands, where we circumvent the use of extreme-value theory and rather rely on recent results on anti-concentration of Gaussian processes. In a simulation study we investigate the performance of the uniform confidence sets for finite samples.

Keywords Berkson errors-in-variables · Deconvolution · Gaussian approximation · Uniform confidence bands

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