On boundary correction in kernel estimation of ROC curves

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Abstract: The Receiver Operating Characteristic (ROC) curve is a statistical tool for evaluating the accuracy of diagnostics tests. The empirical ROC curve is the most commonly used non-parametric estimator for the ROC curve. To derive a smooth estimate for the ROC curve, we use a kernel smoothing method which has better statistical properties than empirical method. For this process one needs to estimate a distribution function. It is well known now that kernel distribution estimators are not consistent when estimating a distribution function near the boundary of its support. This problem is due to "boundary effects" that occur in nonparametric functional estimation. To avoid these difficulties in this paper, we propose a generalized reflection method of boundary correction in the estimation problem of ROC curves. The proposed method generates a class of boundary corrected estimators.

Keywords: kernel estimation, reflection, distribution estimation, ROC curve.

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