Extending induced ROC methodology to the functional context

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Abstract

The receiver operating characteristic (ROC) curve is the most widely used
measure for evaluating the discriminatory performance of a continuous
marker. Often, covariate information is also available and several regression methods have been proposed to incorporate covariate information
in the ROC framework. Until now, these methods are only developed
for the case where the covariate is univariate or multivariate. We extend
ROC regression methodology for the case where the covariate is functional
rather than univariate or multivariate. To this end, semiparametric– and
nonparametric-induced ROC regression estimators are proposed. A simulation study is performed to assess the performance of the proposed estimators. The methods are applied to and motivated by a metabolic syndrome
study in Galicia (NW Spain).