Addressing robust estimation in covariate–specific ROC curves with functional covariates

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Abstract

In some situations the presence of functional covariates related to the diagnostic marker may increase the discriminating power of the ROC curve. In this talk, the covariate effect is modelled through a functional linear regression model.

Given the extended belief that ROC curves are robust and aware of the impact that outlying values may have on the diagnostic test accuracy, we center our attention on the robust aspects of the conditional ROC curve estimation procedures. Since regression models are involved, atypical data among the responses and/or the covariates may severely affect the estimation methods. Moreover, when dealing with functional data the detection of outliers is more complex, since, in such a situation, different types of atypical data may arise.

We will present robust procedures when there are functional covariates and provide some results regarding the uniform consistency of the estimators. The finite-sample numerical study illustrates the robustness of the proposal.