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FUNCTIONAL DISCRIMINANT ANALYSIS VIA REGULARIZED WAVELETS

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The classification or discrimination technique is one of the most widely used statistical tools in various fields of natural and social sciences. It is often the case that the dimension of the predictors is quite large, while the whole population of training data set is relatively small. In such cases, direct methods are no longer applicable because the variance-covariance matrix becomes non-singular and the Mahalanobis distance can not be calculated. We introduce a method of functional logistic discriminant analysis, which expresses each piece of observation as a functional predictor. For converting the discrete observations into the functional form, we use a regularized wavelet method which we have proposed for the case that the design points are irregular and not unified, whereas the vast majority of wavelet-based regression method have been conducted within the setting that the design points are decimal and equally spaced. An information-theoretic and Bayesian information criteria are presented for evaluating the models estimated by the regularization in the context of wavelet functional discriminant procedure. The proposed functional discriminant procedure via regularized wavelets is illustrated through the analysis of real data and some numerical examples.

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