VISUALIZING CLASSIFICATION RESULTS:
GRAPHICAL TOOLS FOR DD-CLASSIFIERS

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ABSTRACT: DD-classifiers have been widely used to perform classification tasks given that they are non-parametric and flexible and can also be applied in high-dimensional spaces when a suitable notion of depth is adopted. The aim of DD-classifiers is to assign new unlabeled observations to the labeled groups based on their depth values with respect to each group. Visualizing the cases being classified can be very interesting. It can reveal a clue about the data and the classification method as well, e.g. the causes for which some observations are misclassified or whether the classifier is appropriate to the data or not, which can be reflected by the posterior probability of the alternative class. For these reasons, rather than focusing on the mechanism of the DD-classification procedure itself, we investigate how the silhouette plot, the class map and the quasi-residual plot can be adopted to visualize the results of the DD-classifiers. Several real data examples are considered in order to illustrate the potential of these visualization tools. We also use the average silhouette width to compare the results of DD-classifiers exploiting different discriminant rules when associated with different depths for each data set.

KEYWORDS: Discriminant analysis, silhouette plot, class map, quasi residual plot.