
Classification of multivariate functional data based on depth

Peter Rousseeuw*, Mia Hubert, Pieter Segaert

Dept. of Mathematics, KU Leuven, Celestijnenlaan 200B,
BE-3001 Heverlee, Belgium

{Peter.Rousseeuw,Mia.Hubert,Pieter.Segaert}@wis.kuleuven.be

Recently, the notion of multivariate functional halfspace depth has been proposed. It considers a set of multivariate curves on the same time interval, and defines the depth of a curve as the (possibly weighted) integral of its halfspace depth at each time point. This depth function is applied to supervised classification. A new distance measure is based on it, from which a classifier is derived. Comparisons are made with the functional k-nearest neighbor method, the maximum depth classifier, and a method based on the depth-depth plot. Their behavior is also studied in the presence of outlying curves.

Keywords: Discriminant analysis; Multivariate functional depth; Outliers.