

Combining Models in Discrete Discriminant Analysis in the Multiclass Case

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Abstract. The idea of combining models in Discrete Discriminant Analysis (DDA) is present in a growing number of papers which aim to obtain more robust and more stable models than any of the competing ones. This seems to be a promising approach since it is known that different DDA models perform differently on different subjects (Brito et al.(2006)). In particular, this will be a more relevant issue if the groups are not well separated, which often occurs in practice.

In the present work a new methodological approach is suggested which is based on DDA models' combination. The multiclass problem is decomposed into several dichotomous problems that are nested in a hierarchical binary tree (Sousa Ferreira (2000), Brito et al. (2006)) and at each level of the binary tree a new combining model is proposed to derive the decision rule. This combining model is based on two well known models in the literature - the First-order Independence Model (FOIM) and the Dependence Trees Model (DTM) (Celeux and Nakache (1994)).

The MATLAB software is used for the algorithms' implementation and the proposed approach is illustrated in a DDA application.

Keywords: Combining model, Discrete Discriminant Analysis , First-order Independence Model, Dependence Trees Model

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