Differential Evolution Classifier with Optimized Distance Measures for the Features in the Data Sets

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Abstract
In this paper we propose a further generalization of differential evolution based data classification method. The current work extends our earlier differential evolution based nearest prototype classifier that includes optimization of the applied distance measure for the particular data set at hand. Here we propose a further generalization of the approach so, that instead of optimizing only a single distance measure for the given data set, now multiple distance measures are optimized individually for each feature in the data set. Thereby, instead of applying a single distance measure for all data features, we determine optimal distance measures individually for each feature. After the optimal class prototype vectors and optimal distance measures for each feature has been first determined, together with the optimal parameters related with each distance measure, in actual classification phase we combine the individually measured distances from each feature to form an overall distance measure between the class prototype vectors and sample. Each sample is then classified to the class assigned with the nearest prototype vector using that overall distance measure. The proposed approach is demonstrated and initially evaluated with three different data sets.