Ph: 9585554590, 9585554599
Email: support@salemsmartreach.com
URL: www.salemsmartreach.com

Clustering-Based Discriminant Analysis for Eye Detection

Abstract:

This paper proposes three clustering-based discriminant analysis (CDA) models to address the problem that the Fisher linear discriminant may not be able to extract adequate features for satisfactory performance, especially for two class problems. The first CDA model, CDA-1, divides each class into a number of clusters by means of the k-means clustering technique. In this way, a new within-cluster scatter matrix Sw^c and a new between-cluster scatter matrix Sb^c are defined. The second and the third CDA models, CDA-2 and CDA-3, define a nonparametric form of the between-cluster scatter matrices N-Sb^c. The nonparametric nature of the between-cluster scatter matrices inherently leads to the derived features that preserve the structure important for classification. The difference between CDA-2 and CDA-3 is that the former computes the between-cluster matrix N-Sb^c on a local basis, whereas the latter computes the between-cluster matrix N-Sb^c on a global basis. This paper then presents an accurate CDA-based eye detection method. Experiments on three widely used face databases show the feasibility of the proposed three CDA models and the improved eye detection performance over some state-of-the-art methods.