Abstract

A number of applications require robust human face recognition under varying environmental lighting conditions and different facial expressions, which considerably vary the appearance of human face. However, in many face recognition applications, only a small number of training samples for each subject are available; these samples are not able to capture all the facial appearance variations, to utilize the resampling techniques to generate several subsets of samples from the original training dataset. A classic appearance-based recognizer, LDA-based classifier, is applied to each of the generated subsets to construct a LDA representation for face recognition.

The discrimination power of various human facial features is studied and a new scheme for automatic face recognition (AFR) is proposed. This paper focuses on the linear discriminant analysis (LDA) of different aspects of human faces in the spatial as well as in the wavelet domain. The LDA of faces also provides us with a small set of features that carry the most relevant information for classification purposes. The features are obtained through eigenvector
analysis of scatter matrices with the objective of maximizing between-class variations and minimizing within-class variations. The result is an efficient projection-based feature-extraction and classification scheme for AFR. Multisource data analysis are used to provide more reliable recognition results. For a medium-sized database of human faces, excellent classification accuracy is achieved with the use of very-low-dimensional feature vectors. Moreover, the method is applicable to many other image-recognition tasks.

References


16. Sanghoon Kim, Sun-Tae Chung, Souhwan Jung, Seoungseon Jeon, Jaemin Kim,


Index Terms

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Keywords

Face recognition, feature extraction, linear discriminant analysis (LDA).