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Authors:

M Sharmila Kumari

Swathi Salian

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Abstract

In these days, appearance based approaches gain popularity in many computer vision problems, more in particular on face recognition techniques. In this context, a study on face recognition techniques based on appearance based paradigm is addressed in our work. More focus is provided to principal component analysis (PCA) based techniques where the principle of PCA is well received by pattern recognition community for most of the dimensionality reduction problems or for feature selection in a large collection of features set. We have seen several variants of PCA in the literature applied to the domain of face recognition considering variety of natural problems that would occur during face recognition. In our work, we have

made an attempt to study the problem of face recognition under different situations. The study is conducted with varying dimension of features on a variety of face databases which include pose, illumination and occlusion problems. The effect of varying training samples is also addressed in our study. We have considered the standard PCA, two dimensional PCA (2D PCA) which works in row directions, alternative 2D PCA that works in column directions and bidirectional PCA for comparative analysis on many of the standard face databases such as AT&T, UMIST and IITK datasets. Extensive experimental results on each of these datasets along with computing time and their recognition accuracy under different dimension of feature vectors with varying number of training samples is reported in our work.

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Index Terms

Computer Science   Image Processing

Keywords

Principal Component Analysis   Two-dimensional Pca   Bidirectional Pca   Eigen Face Face Recognition.