Project Proposal

Face Recognition Using PCA

Group members

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Language Python will be used in project

Introduction

The strategy of face recognition involves the examination of facial features in a picture, recognizing those features and matching them to 1 of the many faces in the database. There are lots of algorithms effective at performing face recognition, such as for instance: **Fisherface algorithm** Principal Component Analysis, Discrete Cosine Transform, 3D acceptance methods, Gabor Wavelets method etc. This work has centered on Principal Component Analysis (PCA) method for face recognition in an efficient manner. There are numerous issues to take into account whenever choosing a face recognition method. The main element is: Accuracy, Time limitations, Process speed and Availiability. With one of these in minds PCA way of face recognition is selected because it is really a simplest and easiest approach to implement, extremely fast computation time. PCA (Principal Component Analysis) is an activity that extracts the absolute most relevant information within a face and then tries to construct a computational model that best describes it.

Algorithm Used

Popular recognition algorithms include principal component analysis using eigenfaces, linear discriminant analysis, elastic bunch graph matching using the **Fisherface algorithm**, the hidden Markov model, the multilinear subspace learning using tensor representation, and the neuronal motivated dynamic link matching.

Sample Code

```
# Import matplotlib library
import matplotlib.pyplot as plt

# Import scikit-learn library
from sklearn.model_selection import train_test_split
from sklearn.model_selection import GridSearchCV
from sklearn.datasets import fetch_lfw_people
from sklearn.metrics import classification_report
from sklearn.metrics import confusion_matrix
from sklearn.decomposition import PCA
from sklearn.svm import SVC

import numpy as np
```

Sample Picture

Conclusion

The main idea of using PCA for face recognition is to express the large 1-D vector of pixels constructed from 2-D facial image into the compact principal components of the feature space. ... Eigenspace is calculated by identifying the eigenvectors of the covariance matrix derived from a set of facial images(vectors).