**EIGENFACES FOR IMAGE RECOGNITION**

**Abstract :**

Eigenfaces is an approach invented in 1987 for facial recognition, which essentially uses well-known linear algebra operations to attempt to match a candidate face against a database of existing face images.

Though in recent years deep neural networks and other methods have shown accuracies of 99%+, the purpose of this project is to investigate how an eigenface facial recognition system can be built from the ground up, and determine what parameters of the system are optimal.

**Data :**

120 images were collected -- 3 images of 40 celebrities, and a database was created. Every image gets preprocessed by converting to grayscale, detecting the face area using opencv, subtracting the mean of the dataset, resizing it to a 100 x 100 image, and then applying a histogram normalization on the image.

**Methodology :**

To perform face recognition eigenfaces was used to find the weights for all images in the dataset, and the new candidate image. We then use one the methods (L1-norm, L2-norm, Random Forest) to determine what person the new image is most similar to.

**Libraries used** :

numpy, opencv, matplotlib, and sklearn