FACE RECOGNITION USING FISHER LINEAR DISCRIMINANT ANALYSIS(LDA)

- Reetu Hooda

Big Data Analytics
CS 696
Fall 2018

Professor:
Dr. Vineetha Menon

Outline

- Introduction
- Implementation
- Results
- Conclusion

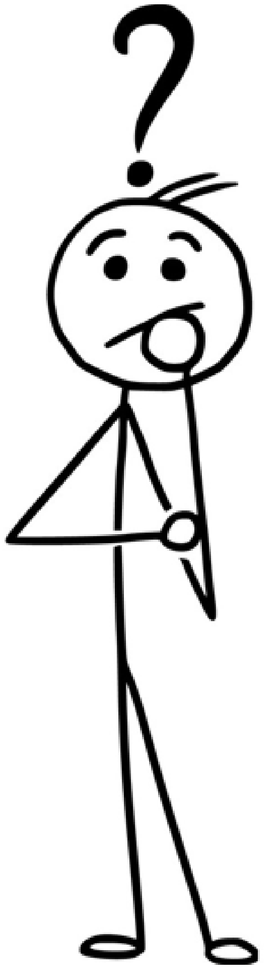
INTRODUCTION

- Project 1:

  PCA on detected images? → Eigenfaces!!

- Project 2:

  LDA on detected images using Eigenfaces? → Fisherfaces !!



- Optimizing objective function:

  Minimize → Within class variance.

  Maximize → Between class variance.

- Gain clear separation between class of interest and other classes.

IMPLEMENTATION

- One versus-all (OVA) approach.
- Perform PCA on $(S_W{}^{-1}S_B)$.
- Fisherfaces.
- Project training data to particular Fisherface.
- Binning projection values into Histogram.
- Determining threshold using distribution.
- Using thresholds to classify.
- Projection coefficient.

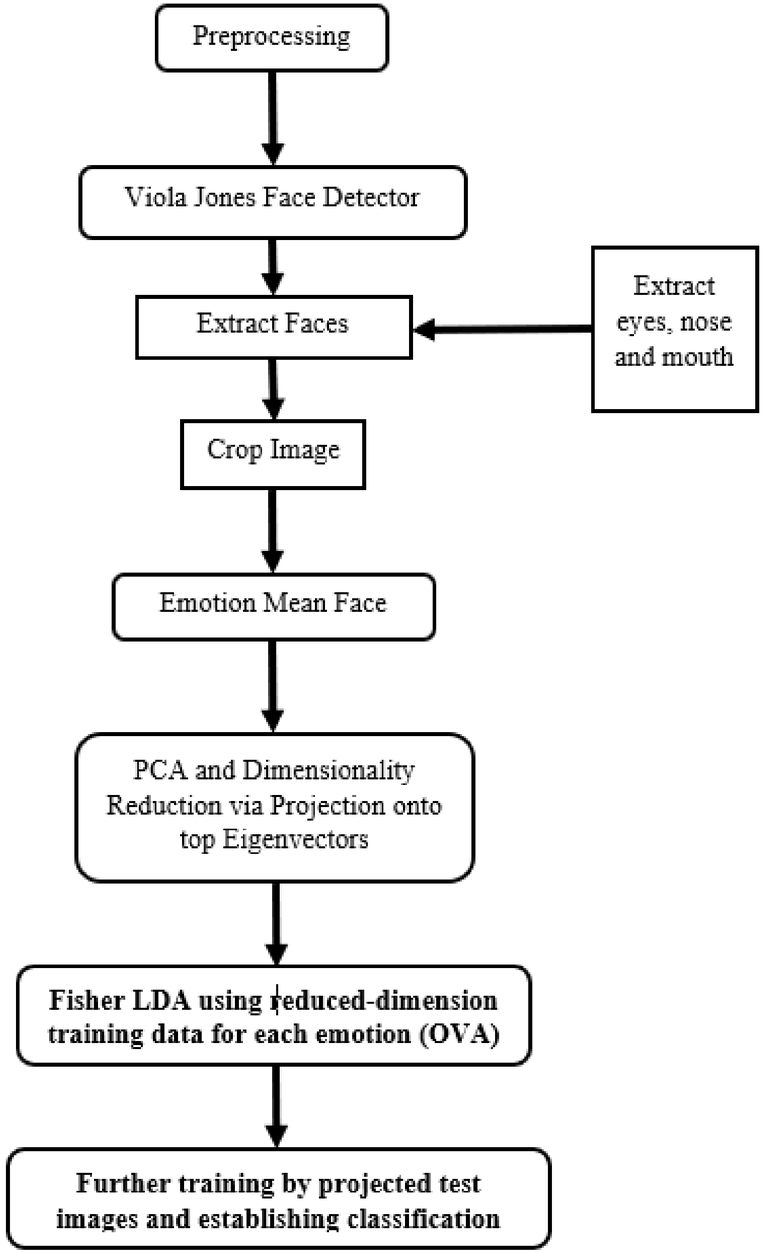


Figure 1: Flowchart of the algorithm.

RESULTS

- Extracted Fisherface.
- Project test data onto Fisherface.
- Poor result: Inability to detect contempt and disgust.
- “Easy to distinguish” emotions.
- Distinct and blatant feature.

Algorithm	Accuracy
Fisherface only (Angry, Fear, Sad, Surprise, Happy)	90%
Fisherface only (All 7 emotions)	56%

Figure 2(d): Fear Fisherface.

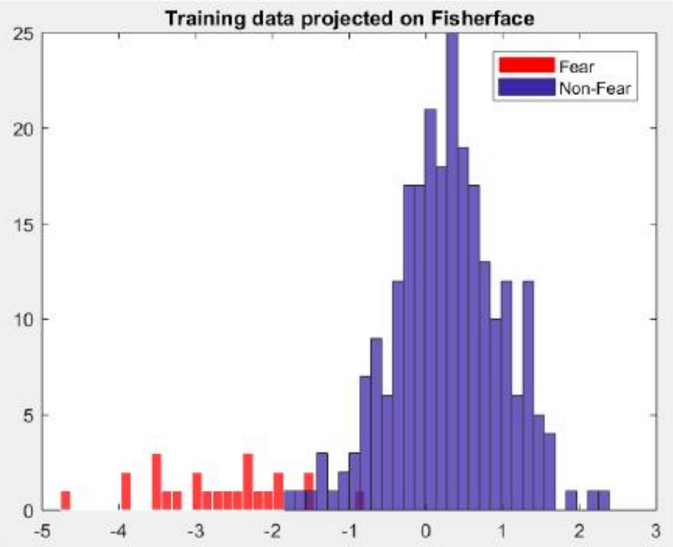


Figure 3(d): Threshold for Fear.

Figure 2(e): Angry Fisherface.

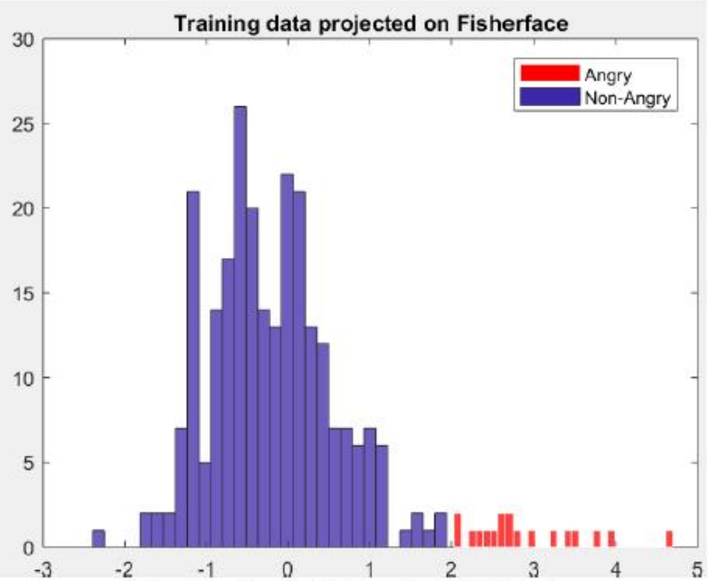


Figure 3(e): Threshold for Anger.

FISHERFACES

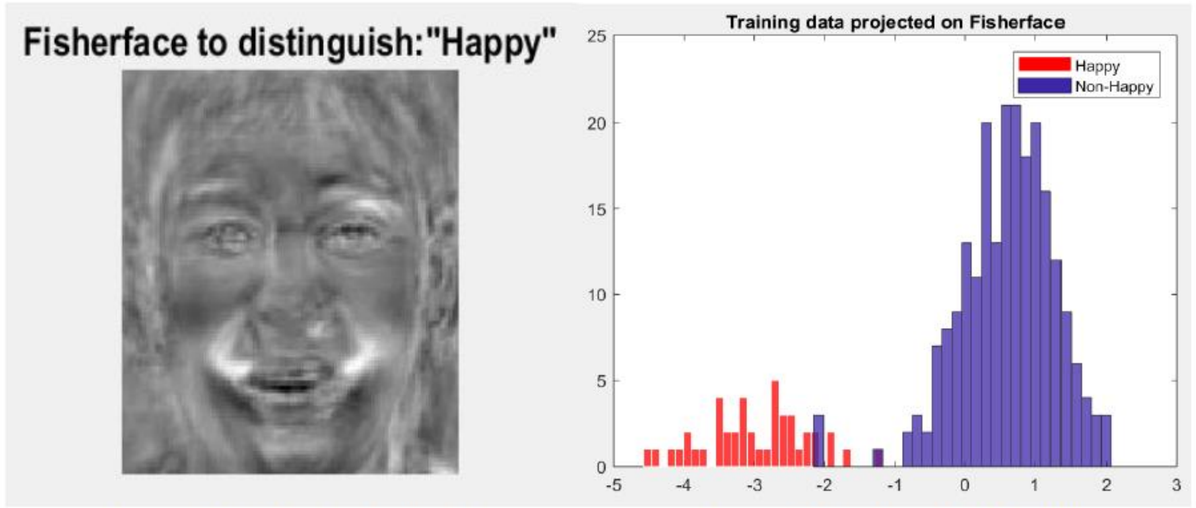


Figure 2(a): Happy Fisherface.

Figure 3(a): Threshold for Happy.

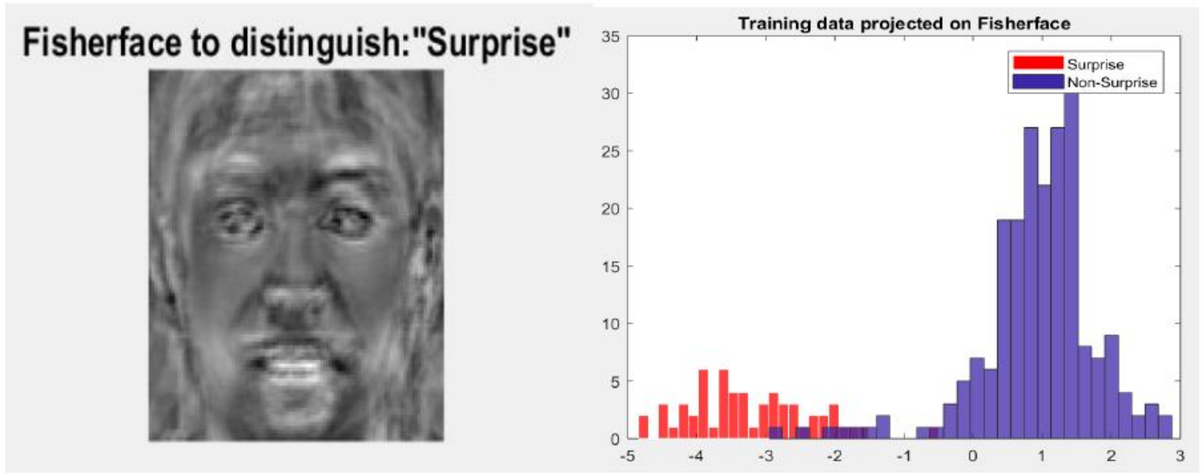


Figure 2(b): Surprise Fisherface.

Figure 3(b): Threshold for Surprise.

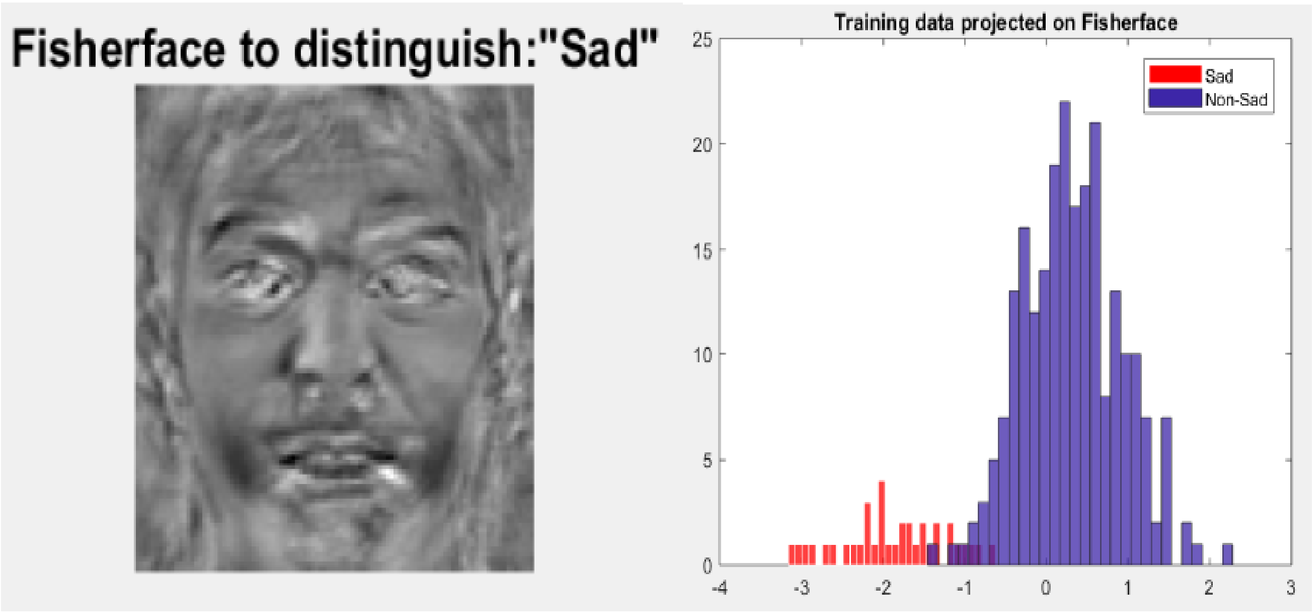


Figure 2(c): Sad Fisherface.

Figure 3(c): Threshold for Sad.

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

CONCLUSION

- Fisherface approach is limited in success by itself.
- Contempt and disgust are difficult to detect.

FUTURE WORK

- Develop another classifier in addition to the Fisherface based classifier.
- Most expression information is encoded within the inner facial features.

Thank You!

Any questions?