International Journal of xxxxxx
Vol. x, No. x, (20xx), pp. xx-xx

Real Time Face Emotion Recognition System

Dr. Makrand Shahade#,Shriraj Hagawane*,Pradip Kakade*,Mangesh Raut*,Tejas Gosavi*
#Assoc Prof, Department Of Computer Engineering,JSPM's RSCOE Pune
*Scholar, Department Of Computer Engineering,JSPM's RSCOE Pune
#manu1509.shahade@gmail.com,*srh412911@gmail.com,*pradipkakade321@gmail.com,
*mangeshraut71298@gmail.com *tejasgosavi7@gmail.com

Abstract

This will give brief knowledge about Face DetectionandrecognitionAlgorithms (Approaches).There are few approaches which will be helpful to detect face from the static or binary frame. The Paper will review the algorithm which is being used for detecting face and will give information about following algorithm they are Elastic bunch map graphing,PrincipalComponentAnalysis(PCA),Protomorphic Approach, Cascading technique.

Keyword: *face Detection, Protomorphic approach, PCA. Elastic bunch map graphing.*

1. Introduction

As a wise man once said," The most beautiful thing in the world, which cannot be seen or touched that is emotion". Fig 1. Will shop all the crucial elements of face detection. The paper is about to find out the emotion of the human being by getting all the information from the emotion or facial by accessing facial point and giving them a result of their action which they are doing. Let's focus on the algorithm for face detection. Brief Flow of Face recognition is done as follow.

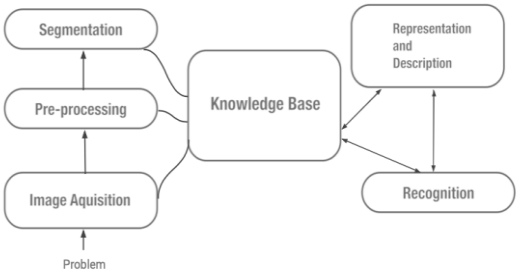

Fig 1. Architecture of image recognition.

ISSN: XXXX-XXXXIJXX

Basically face recognition it is divided into two part

Training:

Here we focus on training the model by uploading the face from a dataset which resides in data in the form of disk and other storage factors.

Deployment:

Once the model is trained we load the face, then perform face detection and then classify each face.

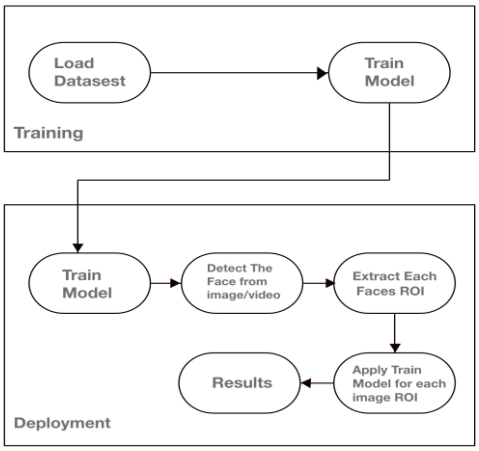

Fig 2. Training and Deployment Architecture

All the steps / elements (Fig 3.) will be covered in below approaches as it all follows the same routine. Basically all the algorithms will have these crucial elements.

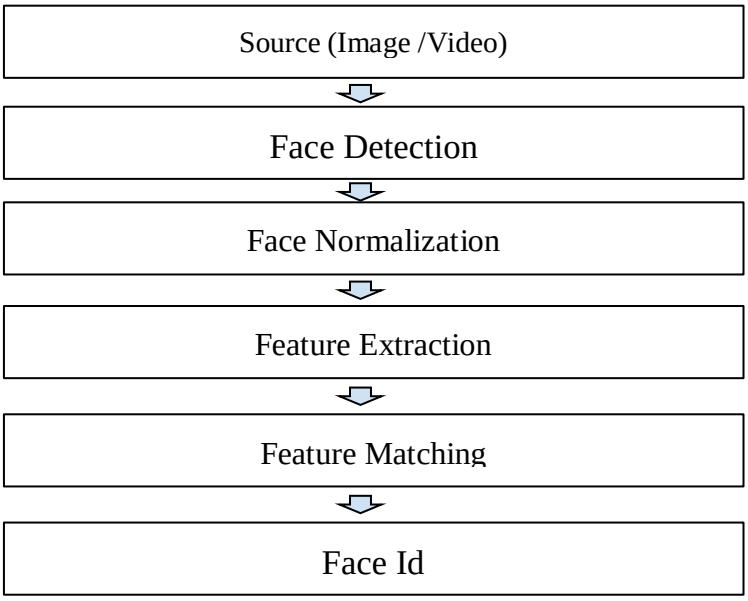

Fig 3. Face detection elements

Different approaches are:

2. Elastic bunch graph matching

The Elastic Bunch Graph Matching stand for EBGM which is used on the image on which is changes surgically. It also used on normal face image which give best result. It is an algorithm which is used to recognize the object or particular part in image a graph representation which is calculated on similar image. It is widely used for face verification, face recognition and face detection analysis and also for motion uses. It will be useful if person is done surgery on the face. Simply it will extract the feature(fixed facial point) from the two different images (before surgery and after surgery) and verify it whether the two image(object in the frame) are identical are not?!. The drawback of this algorithm is that it will take more time as compare to other approaches. This type of face recognition technique referred from face recognition by Elastic bunch graph matching from paper which is published by Laurenz wiskott,Jean-Marc fellous,norbert kruger and christoph von del malsburg. The working of the above algorithm is as follow:

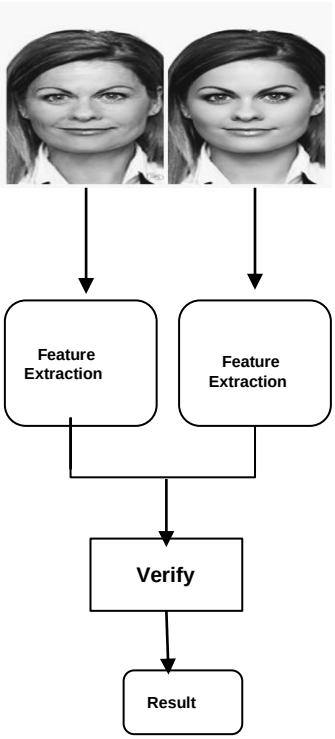

Fig 4. Elastic Bunch Math Graphing.

Here's the following diagram that will show the algorithm working in detail.

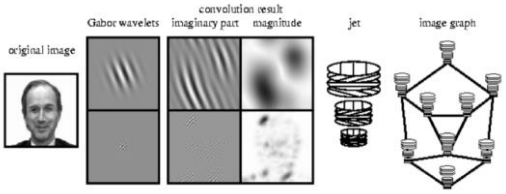

Fig 5. Working model.

3. **Photomorphic Approach**

This is one of the approaches of face detection and recognition in which it purifies the representation of image, compares the value with template and eliminates discrepancies. It depends on the image as an input which is present with light and the geometric location of different angles of that image.

The processing is done on the source image and does not consider any photomorphic changes.The main disadvantage of this image is multiple images of the same human is needed;because it recognizes the image from multiple images and it will not be helpful if the image of different human(person is used).

Fig 6. Image with different light.

4. Principal Component Analysis(PCA)

In this algorithm is uses eigenface it is also known as combination eigenvectors where every image is represented by this where it reduces the number of fikles called **eigenfaces** By calculating the graph it will represent all the orthogonal points on the graph. Following Flowchart referred from the Face Recognition Using Principal Component Analysis paper developed by Method Liton Chandra Paul , Abdulla Al Sumam. Simply it uses n number of eigenvectors that are n number of eigenface and based on this analysis is done. There are some eigenface result image based on that we will identify the finding possibility of face in other word to check whether the face is properly visible or not which image is having or containing high depth as shown in Fig 8.

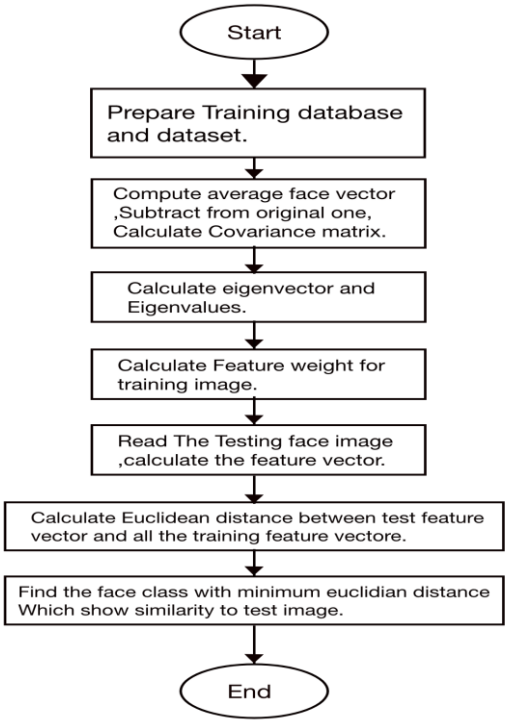

Fig 7. Flowchart of Principal component analysis.

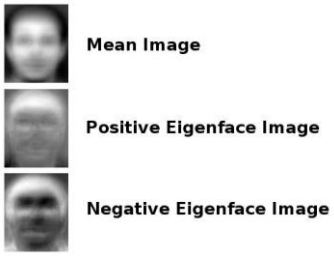

Fig 8. Different eigenface image.

5. Cascading technique

It is one the number of face recognition techniques in which it uses features like edge feature ,line feature ,four rectangle feature. It uses Haar cascades method. IN this n number of positive and negative images are processed. Based on this, machine learning approach is trained for feature extraction. It follow the following steps:

a.Selection of feature.

b.Create reflection of image

c.Use adaboost training

d.Cascade classifier

In other words we can say that it will extract the feature from a given frame,hence it will create the reflection of frame(image) on which adaboost training is being used and then cascade classifier occurs.

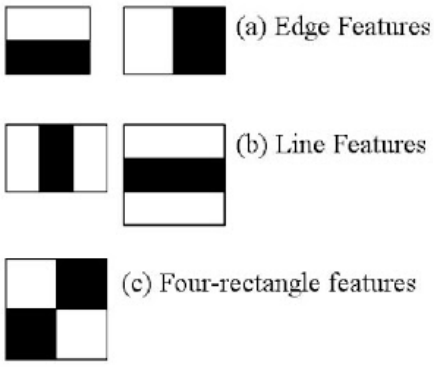

Fig 9. Cascading technique .

6. Conclusion

Hence with above approaches and techniques we conclude, the vital role of this real time system by using algorithms like cascading technique, principal component analysis, elastic bunch graph matching and photomorphic approach which gives rise to various real environment applications and their effects to cause productive approach in various phases of and create graph for it in consistent manner.Also cascading technique also good for recognising the ROI object with the help of its 3 features(edge feature,line Feature,four rectangle Feature).

7. References

[1].Ningthoujam Sunita Devi1, K. Hemachandran2 "Face Recognition Using Principal Component Analysis"Ningthoujam Sunita Devi et al, / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 5 (5) , 2014, 6491-6496.
https://www.researchgate.net/publication/275214892_Face_Recognition_Using_Principal_Component_Analysis

[2]. Kandla Arora,"Real Time Application of Face Recognition Concept", International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-2, Issue-5, November 2012.
https://pdfs.semanticscholar.org/2374/d3eaf0ee8439895956783132076eb3db3832.pdf

[3].Jean-Marc Fellous , Norbert Kr¨uger , and Christoph von der Malsburg,"Face Recognition by Elastic Bunch Graph Matching by Laurenz Wiskott1" , Institute for Neural Computation Ruhr-University Bochum D-44780 Bochum, Germany 2 Computer Science Department University of Southern California Los Angeles, CA 90089, USA.
http://www.face-rec.org/algorithms/EBGM/WisFelKrue99-FaceRecognition-JainBook.

[4]. Yugal Kishor Sahu, Sonu Agrawal,"Elastic Bunch Graph Matching",International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 4 Issue 11, November 2015.

https://pdfs.semanticscholar.org/4e55/df9f62872a4efc332a71c4f8287c9fff9941.pdf

[5].Cascade haar explained
http://www.willberger.org/cascade-haar-explained/

[6].Liton Chandra Paul,Abdulla Al Sumam,"Face Recognition Using Principal Component Analysis Method",ISSN: 2278 – 1323 International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 1, Issue 9, November 2012

http://ijarcet.org/wp-content/uploads/IJARCET-VOL-1-ISSUE-9-135-139.pdf

[7]. Aishwarya Admane1, Afrin Sheikh, Sneha Paunikar, Shruti Jawade, Shubhangi Wadbude,Prof. M. J. Sawarkar,"A Review on Different Face Recognition Techniques",International Journal of Scientific Research in Computer Science, Engineering and Information Technology © 2019 IJSRCSEIT | Volume 5 | Issue 1 | ISSN : 2456-3307

https://doi.org/10.32628/CSEIT195159

http://ijsrcseit.com/paper/CSEIT195159.pdf

[8]. "negative positive and negative eigenfaces"
https://learn.adafruit.com/raspberry-pi-face-recognition-treasure-box/training-1

[9].K. Sunil Manohar Reddy,Assistant Professor, Department of CSE, Matrusri Engineering College, Hyderabad, Telangana, India,"Comparison of Various Face Recognition Algorithms",International Journal of Advanced Research in Science, Engineering and Technology,Vol. 4, Issue 2 , February 2017.
http://www.ijarset.com/upload/2017/february/21_IJARSET_sunilreddy.pdf.

[10].Dilbag Singh Computer Science and Engineering Dept.Guru Nanak Dev University Amritsar (Punjab) India. e-mail: dggill2@gmail.com,"Human Emotion Recognition System",I.J. Image, Graphics and Signal Processing, 2012, 8, 50-56 Published Online August 2012 in MECS (http://www.mecs-press.org/)
https://pdfs.semanticscholar.org/20d8/266053663b787bf426efd4cd8336dc61fd63.pdf?_ga=2.98440415.1536470589.1589199653-2013773852.1589199653