High Quality Facial Recognition System

Bhagyashri Mahajan, Khushabu Salunkhe, Sneha Kurkure, Pooja Gurav, Swati Patil
Department of Computer Science and Engineering
G. H. Raisoni Institute of Business Management, Jalgaon, Maharashtra, India

ABSTRACT

High Quality automatic face recognition System may be a web base application. A top quality face recognition System could be a technology capable of identifying or verifying an individual from a digital image or a video frame from a video source. There are multiple methods within which biometric authentication system work, but normally, they work by comparing selected facial expression from given image with faces within a database. it's also described a Biometric AI based application that may uniquely identify someone by analyzing patterns supported the person's facial, texture and shape.

We are using some different features also in our project. Example. Eyes or lips, some people have eyes in different shape or some people have little different, also the lips and nose are different. Means distance between nose and lips are difference off every one. So such features we use. Then in our project two phases are there the primary one is implementation of detection and second is recognition.

Face Recognition has become a pretty field in Computer based application developed within the previous few decades. this can be thanks to the big selection of areas during which it's used. additionally, due to the wide various of faces, face recognition from database images, real data, capture Images.

Keyword: *Distance Measurements, Face Recognition, Encoding, Artificial Neural Network, Feature Extraction Techniques, Accuracy*

---

1. INTRODUCTION

High Quality Facial Recognition System is a Software Base and Web Base Application. A High Quality Facial Recognition System is a Technology Capable of identifying or verifying a person from a digital image or a video frame from a video source. There are multiple methods in which facial recognition systems work, but in general, they work by comparing selected facial features from given image with faces within a database. It is also described as a Biometric Artificial Intelligence based application that can uniquely identify a person by analyzing patterns based on the person's facial textures and shape. We are going to use some different features in our project.

Over the most recent couple of decades, facial recognition has been considered the standout among the most imperative applications compared to other biometric-based systems. Face Recognition has become an attractive field in Computer-based application developed in the last few decades. This is because of the wide range of areas in which it is used. In addition, because of the wide various of faces, face recognition from database images, real data, capture images.[3]

The task of face recognition has been actively researched in recent years. This paper provides an up-to-date review of major human face recognition research. We first present an overview of face recognition and its applications. Then, a literature review of the most recent face recognition is presented. Description and limitations of face databases which are used to test the performance of these face recognition algorithms are given. A brief summary of the face recognition vendor test, a large scale evaluation of automatic face recognition technology, and its conclusions are also given. Finally, we give a summary of the research results.[4]

A tremendous interest in deep learning has emerged in recent years. The most established algorithm among various deep learning models is convolutional neural network (CNN), a class of artificial neural networks that has been a dominant method in computer vision tasks since the astonishing results were shared on the object recognition competition known as the ImageNet Large Scale Visual Recognition Competition (ILSVRC) in 2012. [5]

2. LITERATURE SURVEY

As one of the most successful application of image analysis and understanding, face recognition has recently received significant attention, especially during the past several years. At least two reasons account for this trend: the first is the wide range of commercial and law enforcement applications, and the second is the availability of feasible technologies after 30 years of research. Even though current machine recognition systems have reached a certain level of maturity, their success is limited by the conditions imposed by many real applications. For example, recognition of face images acquired in an outdoor environment with changes in illumination and/or pose remains a largely unsolved problem. In other words, current systems are still far away from the capability of the human perception system.[1]

As a primary modality in biometrics, human face recognition has been employed widely in the computer vision domain because of its performance in a wide range of applications such as surveillance systems and forensics. Recently, near infrared (NIR) imagery has been used in many face recognition systems because of the high robustness to illumination changes in the acquired images. Even though some surveys have been conducted in this infrared domain, they have focused on thermal infrared methods rather than NIR methods.[2]

Face recognition has become an attractive field in computer-based application development in the last few decades. This is because of the wide range of areas in which it is used. In addition, because of the wide variations of faces, face recognition from database images, real data, capture images, and sensor images are a challenging problem and limitation. Image processing, pattern recognition, and computer vision are relevant subjects to the face recognition field. The innovation of new approaches of face authentication technologies is a continuous subject to building much stronger face recognition algorithms.[3]

The task of face recognition has been actively researched in recent years. This paper provides an up-to-date review of major human face recognition research. We first present an overview of face recognition and its applications. Then, a literature review of the most recent face recognition techniques is presented. Description and limitations of face databases which are used to test the performance of these face recognition algorithms are given. A brief summary of the face recognition vendor test (FRVT) 2002, a large scale evaluation of automatic face recognition technology, and its conclusions are also given. Finally, we give a summary of the research results.[4]

3. PROBLEM DEFINITION

In existing system, we detect person by their age, color, gender etc. but We Modify our technology and now detect person by using their facial extract 120 points. So that we completely identify the person.

4. OBJECTIVE

Main objective of this project is to identify a person using the image, identification will be done according the image of different person. This face recognition system will identify individual based on characteristics of separate face segmentation and the objective of project as follows.

1. Identify unique face features of eye, nose and mouth region of recognize individuals.

2. Improve capabilities of detecting features of the local segmentation of face, so that necessary to find the efficient algorithm to extract features of segmentation.

5. ARCHITECTURE
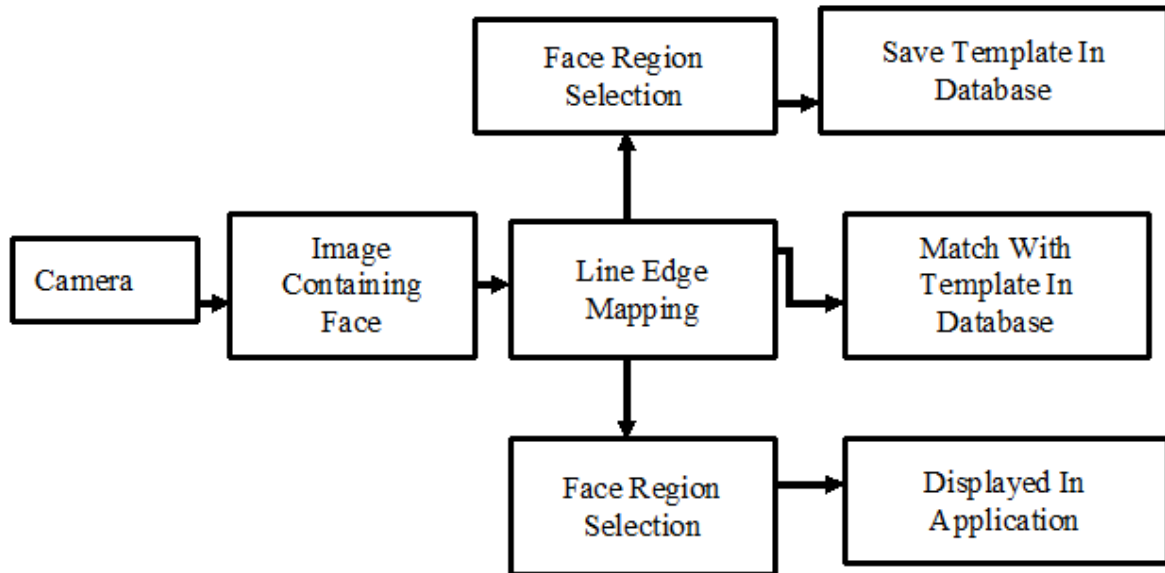
6. ALGORITHM

1. Principal Component Analysis(PCA)[3]**:** Principal Component Analysis, or PCA, is a dimensionality-reduction method that is often used to reduce the dimensionality of large data sets, by transforming a large set of variables into a smaller one that still contains most of the information in the large set.-

Why PCA is used in face recognition?

In the task of human facial recognition, PCA is normally used to produce a set of Eigen faces. Intuitively, you can think of Eigen faces as a set of standard face elements, that you calculate by statistically analyzing a large number of face images.
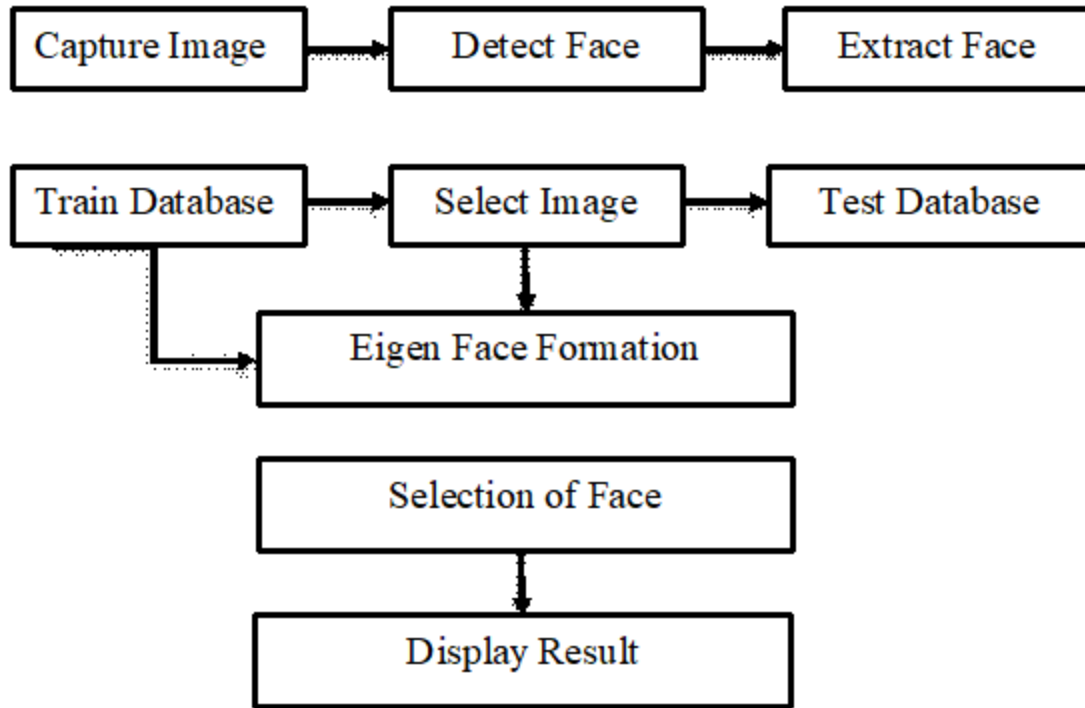
2. Convolutional Neural Network(CNN)[5] **:** A Convolution Neural Network (Convent/CNN) is which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other.
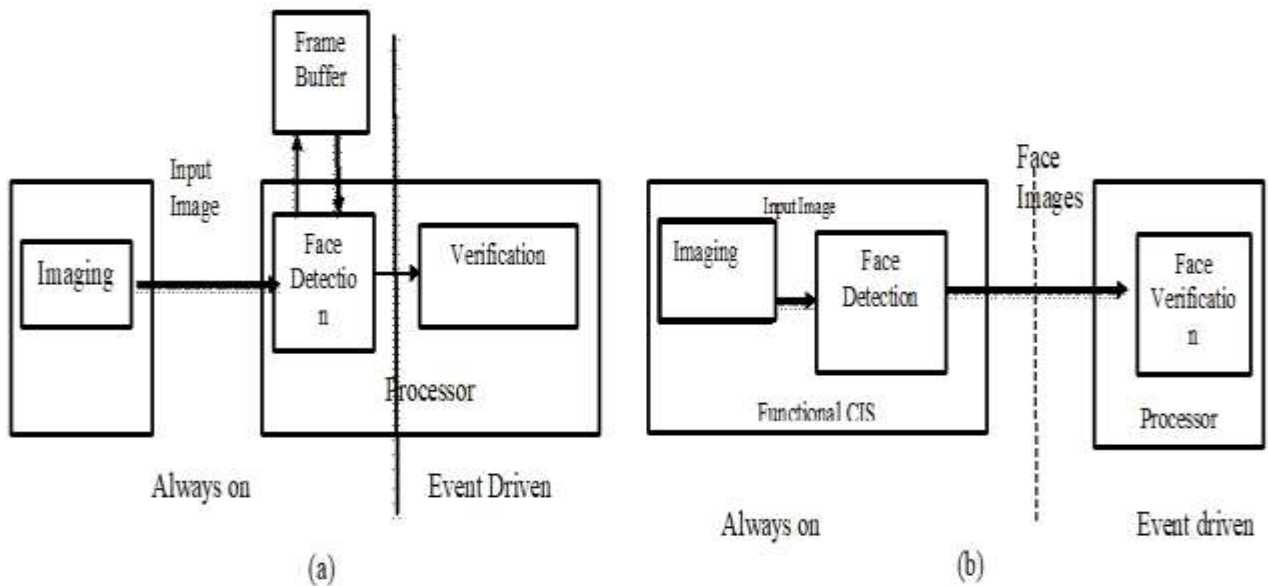
3. Linear Discriminant Analysis(LDA)[6]**:** Linear Discriminate Analysis (LDA) is a popular feature extraction technique for face image recognition and retrieval. However, It often suffers from the small sample size problem when dealing with the high dimensional face data.
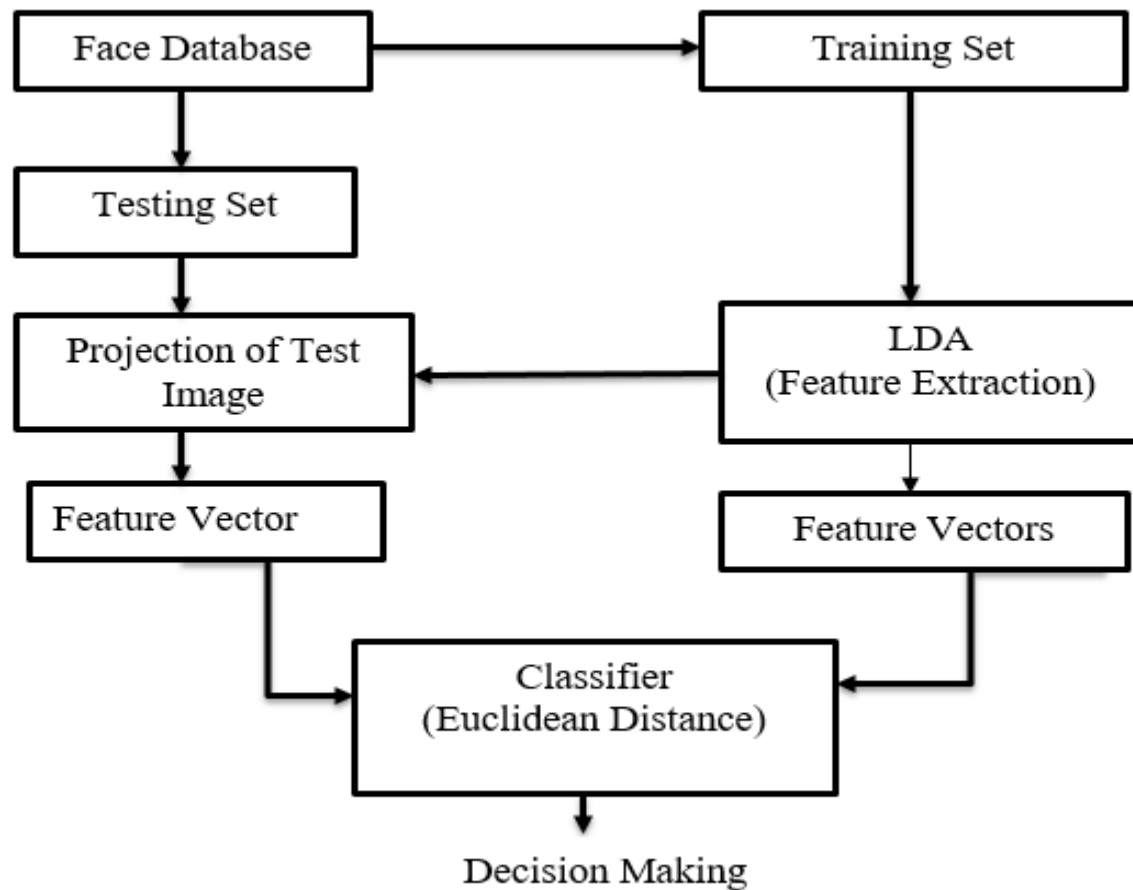
7. CONCLUSION

The High Quality Facial Recognition System is a Software base and Web base application. This technology is used to identifying or verifying a person from digital image or video frame from video source.

The High Quality Facial Recognition System is one of the newer developments of biometric Artificial Intelligence based application that can be identifying person. Other biometric identifiers such as a fingerprint scanner and voice recognition require many different pieces in order to function.

The High Quality Facial Recognition System is highly effective biometric technology that holds a lot of potential. The High Quality Facial Recognition System can save resources and time and even generate new income streams for companies that implement it right.

8. FUTURE SCOPE

The future of High Quality Face Recognition System technology is bright. Forecasters opine that this technology is predicted to grow at a formidable rate and may generate huge revenues within the approaching years. Security and surveillances are the foremost segments which may be deeply influenced. Other areas that are now welcoming it with open arms are private industries, public buildings, and schools.

It's estimated that it will even be adopted by retailers and industry in coming years to remain fraud in debit/credit card purchases and payment especially people who are online.

This technology would fill within the loopholes of largely prevalent inadequate password system. Within the long run, robots using biometric authentication technology may also come to foray. They'll be helpful in completing the tasks that are impractical or difficult for person to complete.

9. REFERENCE

[1] Wenyi Zhao, R. Chellappa, P. Phillips, A. Rosenfeld, "Face Recognition" Publications: ACM Computing Survey, They paper published on 2003..

https://www.semanticscholar.org/paper/Face-recognition%3A-A-literature-survey-Zhao-Chellappa/28312c3a47c1be3a67365700744d3d6665b86f22#citing-papers

[2] Sajad Farokhi , J. Flusser, U. U. Sheikh "Near In624624frared Face Recognition " Computer Science Review, They paper published on 2016..

https://www.semanticscholar.org/paper/Near-infrared-face-recognition%3A-A-literature-survey-Farokhi-Flusser/e58868819cb4fc19d0e5e5e67a7351743306851b#citing-papers

[3] Shakir Fattah kak, Firas Mahmod Mustafa, Pedro Valente, "A Review of Person Recognition Based on Face Model" . This paper Published on January 2018.

DOI: 10.23918/eajse.v4i1sip157

https://www.researchgate.net/publication/323611486_A_Review_of_Person_Recognition_Based_on_Face_Model

[4] Ahmad Tolba, Ali El-Baz, Ahmed A El-Harby, "Face Recognition: A Literature Review" They paper published on January 2005.

https://www.researchgate.net/publication/233864740_Face_Recognition_A_Literature_Review

[5] Rikiya Yamashita, Mizuho Nishio, Richard Kinh Gian Do, Kaori Togashi, "Covolutional Neural Networks: An Overview and Application in Radiology" They paper published on 22 June 2018.

https://insightsimaging.springeropen.com/articles/10.1007/s13244-018-0639-9

[6] Hui Kong, Xuchun Li, Jian-Gang Wang, Chandra Kambhamettu, "Ensemble LDA for Face Recognition" They paper published on 2005.

DOI: https://doi.org/10.1007/11608288_23

https://link.springer.com/chapter/10.1007/11608288_23