

## “Facial Biometric For Secure Login Using Facial Feature Extraction”

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### ***Abstract:***

*Face recognition is becoming popular over time and is one of the most important topics in research. It has had many applications in the field of research and has also identified the importance of global or real-world use over the past few years. Facial recognition technology is a challenging area for pattern recognition and computer vision. Most research is limited to the facial recognition system. However, we need to improve the face recognition system because of poor performance and under working conditions. Face recognition technology is used to identify an authorized person especially for security purposes. In this facial recognition technology there are challenging aspects such as the same face, twins, same person of different ages etc. The paper is conversational. This paper discusses the various techniques used for facial feature extraction.*

**Keywords** -Face Detection, Facial Feature Extraction, Database Training, Database Evaluation, Application Test

### **1. Introduction**

Face recognition is the task of identifying something that has already been identified as facial recognition is often confused with the problem of facial recognition on the other hand to determine whether a "face" is a known, or unknown, person who uses this purpose for a facial database to verify this installation night.

#### **1.1 FACE DETECTION**

Face detection involves dividing the image windows into two categories; one that has a face (changing the layer (clutter). It's difficult because although the texture between the face, may vary depending on age, skin color and facial appearance. or that you cannot detect the presence of a face under any kind of lighting conditions, in any layer. The second step is the function of assisting the face intended for taking a picture such as inserting and subtracting any of the faces or faces within this image as a specific binding box with (x, y, width, height).

**The face detection system can be divided into the following steps:-**

**1. Pre-Processing:** To minimize facial expressions, images are made before being added to the network. All good examples of facial images are available through a series of front-facing images to include previews. All images are limited and then adjusted for lighting with standard algorithms.

**2.Classification:** Neural networks are used to classify images as faces or non-faces by training in these examples. We use both our neural network and the Matlab neural network toolbox for this function. Different network configurations are performed to improve results.

**3.Localization:** An educated neural network is used there to search an image's surface and develop it through an interactive box. Various Facial Characteristics of the work you performed on: -Deployment Measurement Study.

### **1.2 FACIAL FEATURE EXTRACTION:**

The second phase is the features extraction phase. This phase receives the detected face as the input. Once the face is detected from the image, subsequently step is to find the features from the face region being detected. The extracted features are:

- Eyes
- Nose
- Lips

First of all eyes are detected using chrome and luminance maps. After eyes nose and lips are extracted using a formula centered on the space existing among both eyes.

For the features extraction purpose 7 points are extracted resting on the face which are:

- Left eye center
- Right eye center
- Eyes midpoint
- Nose tip
- Lips center
- Lips left corner
- Lips right corner

## **2. Literature Survey**

Face detection is a computer technology that determines the location and size of a person's face in a photo (digital). Facial features are available and other items such as trees, buildings and bodies etc. are not considered from the digital image. It can be considered a particular case of the acquisition of an object class, where the worker locates the location and size of all objects in an image in a given class. For face detection, it can be considered in general case for a facial expression. When dealing with a location, the task is to find the locations and size of a known face number (usually only one). Basically there are two types of ways to get a part of the face in the way a given image i.e. feature base and image base method. The feature tries to extract image features and compare them with the facial information. While the image based approach is trying to find the best similarity between training and image testing.

### **METHODS USED:**

#### **APPEARANCE BASED APPROACH**

Characteristics extracted from image is called as features. This gives focus on set of training images and can be called as template matching method. As with time wide range of changes appears on a human face. So to tackle this problem it is learnt from training images to capture representative of facial appearance which is used for face recognition.[11]

### **TEMPLATE-BASED APPROACH**

This approach gives great focus on using the template. In this case by the way, the whole face template has been compared to the known people whose photos are stored in a database. As in below the image, first, the face template is taken and then it is matched with the familiar faces of each stored inside archive image and extract final template for PC or other device and store it in the center database template. The algorithm compares the input images to a database of faces or features. Thus facial patterns are common and to maintain the relationship between the input image and the database icons used for acquisition.[12]

### **KNOWLEDGE BASED METHOD**

These are legal ways in which the main purpose is to enter information on one's face such as skin color, texture, etc. This method basically relies on information from the human brain that is embedded in another kind of rules for finding facial features. It basically takes the relationship between facial features into consideration.[12]

### **NEURAL NETWORKS**

Another very important model used for facial recognition is neural networks. These networks have potential learning how to do jobs. Artificial Neural Networks are used to solve problems in the same way as a human brain it consists of a few units of neurons, arranged in layers, which transform the input vector into another effect. Each unit occupies an input, it performs the operation on it and transmits the output to the next computer. It can easily deal with strange, noisy, and complicated creations, error data and algorithms. It has an amazing ability to get meaning from abstract data. Sidra Batool Kazmi, Qurat-ul-Ain, M.Arfaan Jaffar [13] has used this approach for face recognition.

### **FEATURE BASED APPROACH**

Feature-based technique is a process of incorporating the ability to recognize and exclude different facial features such as eyes, mouth, nose etc. and calculate the geometric relationship between those facial features, thus reducing the image of the facial feature in the geometric feature.[14]

### **MODEL-BASED METHOD**

This approach basically combines a model of variance with a transformational look model i.e. variations in facial features and facial expressions. As we know that later, as a person grows older, a change in personality may occur. This change involves both formation as well various looks but not one. This model therefore focuses on both types of variations in order to see the face correctly. EBGM (Elastic Bunch Graph Matching) is the most widely used model based method. It provides object classification of a class with common structure.[6]

### **GEOMETRIC FEATURE BASED MATCHING**

The geometric feature matching techniques are based on the combination of a geometric feature set from the image. The whole configuration can be defined by a vector. This vector represents the position and size of the face features such as nose, eyes, eyebrows, mouth, beard and outline of face.[6]

### **ADABOOST CLASSIFIER/ LEARNING ALGORITHM**

Transformational development is a type of learning algorithm that creates a 'strong' classifier using training data and 'weak' to read the algorithm and for all iterative steps, a weak classifier with a minimum classification error was selected. This is the method can be used in conjunction with other techniques because performance can increase to a large extent. This is the method is sensitive to vendors and noisy details. Fahn, Chin-Shyurng Wu, Ming-Hui Kao Chang-Yi [10] used Adaboost based multi-classifier for the facial expression classification.

### **GENETIC ALGORITHM**

The process of reorganization used by the human brain is a major challenge. So dealing with it, the most important way using genetic algorithms. Genetic algorithms are seen as a search engine, which makes the algorithm robust and fast. This algorithm detects an unknown image by comparing it with known training images stored in the database and provides additional information about the individual.

Rohini Patil, C.G.Patil [3] has used this approach for emotions recognition and classification

### **LINEAR SUB SPACE METHOD:**

Eigen faces Method:

The first example to use Eigen vectors in facial recognition was developed by Kohonen where a simple neural network was shown to perform face recognition of images that correspond to normal faces. Kirby and Sirovich suggested that face images could be directly inserted using a modest number of images. This idea is first proposed by Pearson in 1901 and then by HOTELLING in 1933. Given a collection of  $n$  by  $m$  pixel training.[2]

### **STATISTICAL APPROCH:**

#### **Vector Machine (SVM):**

The SVMs were first introduced by Osuna et al. to find a face. SVMs serve as a new paradigm to train polynomial operations, neural networks, or radial base function (RBF) classifiers. SVMs apply to an import policy, called a systematic risk reduction, which aims to reduce the overhead of short-term base error. SVM classification is a classification scheme in which a hyper classification plane is selected to minimize the expected classification error of unseen test patterns. In the Osuna et al. has developed an effective method for training SVM for major problems, and used it to deal with adoption.

A number of algorithms exist and a number of strategies are in place to extract the feature but somehow those are limited and overcoming this limit we come up with this article and propose this program.[15]

Number of algorithms are there and number of techniques are there who have been developed for feature extraction but some of them have this limitation and to overcome this limitation we are coming with this topic we are proposing this system.

### **4. Discussion / Result**

Due to real time photos the algorithm is able to detect the face and it is able to find out the details of eyes, nose and mouth properly.

## **5. Conclusion**

The computational models, first used in paper by us, were chosen after extensive research, and successful test results confirm that the conclusions made by the researcher were reliable. The manual face detection system and automated face recognition did not have a 90% recognition accuracy, due to the limited number of eigenface models used for PCA conversion. The system was tested under rigorous conditions in this experimental study and it is thought that the actual performance of the ground would be more accurate. The automated face detection system has shown accuracy and in the opinion of the researcher some work need not be done in this area.

The automated face detection system and recognition system were not very powerful. The only reason for this was the facial recognition system did not show the slightest chance of attacking, scaling or replacing the fragmented facial features. This is one of the program requirements identified in section 2.3. However, if some form of progression, such as an eye-catching strategy, has been used to improve the image of separated faces, performance will increase to levels comparable to the manual face recognition system and recognition. Starting the eye-tracking process would be a small addition to the program and would require no additional research. All the other programs used have yielded excellent results and are a good reflection of the corrupt template and Principal Partition Analysis techniques. The most relevant real-world applications for face detection and recognition systems for mug shot detection and surveillance. There are better techniques such as iris or retina recognition and facial recognition using the hot screen for user access and user authentication systems because these require the highest accuracy. An automated face-to-face automated pose tracking system in real time proposed in chapter 7 may be suitable for use in crowd monitoring systems. If such a system is widely used its ability to detect and track suspects of law enforcement agencies is enormous. In this paper we have discussed number of techniques and algorithm which have been worked on this facial recognition. So it is found that some of them have disadvantages so we have proposed this new technique.

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