

Implementation of Attendance System using Face Recognition

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Abstract –Authentication is one of the significant issues in the era of information system. Among other things, human face recognition is one of known techniques which can be used for user authentication This project report aims at providing a system to automatically record the student's attendance using facial recognition technology during lecture hours in classrooms or hall instead of using traditional manual methods The process of matching facial images which would be automated and semi-automated is referred to as face recognition. Principle Component Analysis (PCA) is among one of the techniques available for face recognition. PCA is a way of identifying patterns in data and expressing the data in such a way to highlight their similarities and differences. Before applying this method to face recognition, a brief introduction is given for PCA from mathematical point of view. The later part of the project report gives an explanation about the implementation of PCA in C#. To understand how we can use our face recognition system, a description of the Graphical User Interface is given

Key Words: Visual Studio, Face Recognition System, Windows.

1. INTRODUCTION

In traditional face-to-face (F2F) class setting, student attendance record is one of the important issues dealt with any school, college and university from time to time. A proper mechanism is required for maintaining or managing attendance record on regular basis. Faculty staff should have a proper mechanism for validation and correctness of student attendance Humans have been using physical characteristics such as face, voice, gait, etc. to recognize each other for thousands of years. Now a day, a person is recognized by his/her personal biological characteristics. Examples of different Biometric systems include Fingerprint recognition, Face recognition, Iris recognition, Retina recognition, Hand geometry, recognition, Signature recognition, among others. In recent years, a considerable attention for face recognition has been particularly received from industry and the research community. research community.

The various types like, thumb impression, face pattern, iris pattern, etc., the thumb pattern for each person is unique and it was easy way to make use of it as an identifier entity. However then if there were any bruise in the fingers, then the pattern would mismatch. Therefore, the

face recognition turned out to be the most suitable method for identifying purpose

A particular attention is given to face recognition. An automated or semi-automated process of matching facial images is referred, as face recognition Principle Component Analysis (PCA) is one of the techniques available for face recognition CA is a way of identifying patterns in data and expressing the data in such a way to highlight their similarities and differences. In the process of this face recognition systems divided into various steps, but the important steps are detection of face and recognition of face. Firstly, to mark the attendance of students, the image of students' faces will be required. This image can be snapped from the camera device, which will be placed in the classroom at a suitable location from where the whole classroom can be covered. This image will act as input to the system.

2. EXISTING SYSTEM

1. Attendance taken manually: -

This is old version method for the attendance system where the teacher/staff/representative take the attendance by call the person name and tick in the attendance register. If it is present, then tick as present or absent.

2. Computer based attendance system:-

This is same as the above session; in this teacher would maintain the database. The teacher would mark the attendance of the student present in the class by ticking in box in front of every student that is maintained in database

3. Android based attendance system:

In this lecturer would mark the attendance of student through android app with the help of bluetooth.

The student present in the class, only that student would be marked as present and teacher would maintain the record.

4. Attendance through fingerprint:-

In this, the student would mark the attendance

With the help of fingerprints.

A database of fingerprints would be maintained

Moreover, that would be match for the attendance

3. PROPOSED SYSTEM

The Proposed system overcomes the problem of the existing system. This project uses the face recognition technique using this student record the attendance.

In the proposed system when student come to the class or lecture system, application is start. It works only is standing

in front of the system (Computer application) the application capture the image and send the processing side. The processing side the application recognizes the face of the student. Finally, the application mark as student present. If the face is not recognizing the application, make as absent.

Our system has two users,

- ☑ Admin
- ☑ Students

Face Recognition Process

There are four steps in face recognition process:

1. Obtain a sample: In a complete, full implemented biometric system, a sensor takes an observation.
2. Extracting Features: For this step, the relevant information is extracted from the predefined captured sample.
3. Comparison Templates: this relies on the applying at hand. For identification purposes, this step will be a comparison between a given picture for the subject and all the biometric templates stored on database.
4. Announce a Match: The face recognition system will return a candidate match list of potential matches.

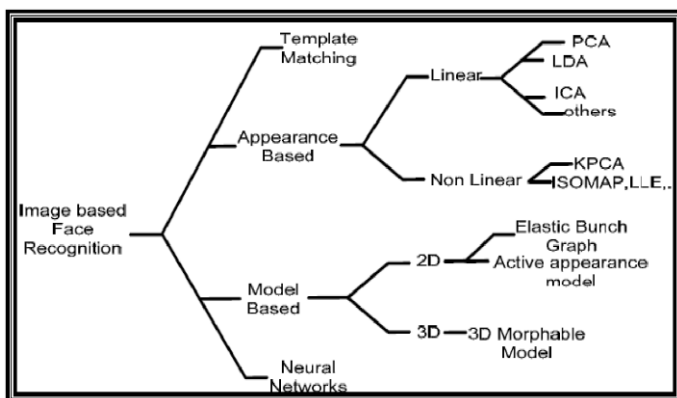
Face Recognition Techniques:

All available face recognition techniques can be classified into four categories

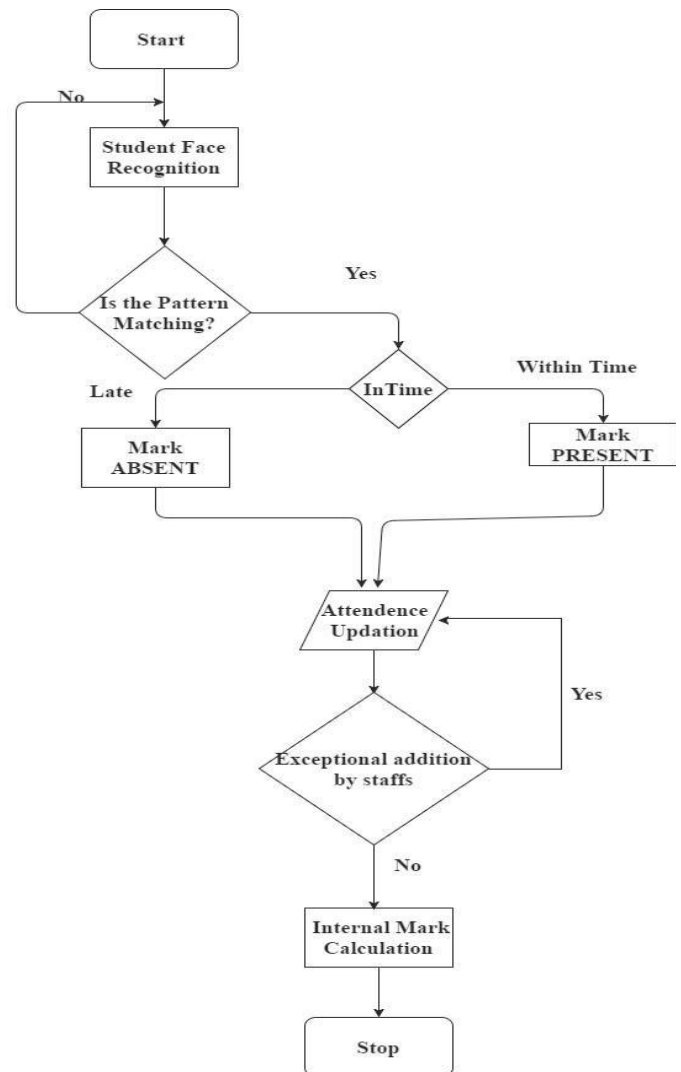
based on the way they represent face:

1. Appearance based which uses holistic texture features.
2. Model based which employ shape and texture of the face, along with 3D depth information.
3. Template based face recognition.
4. Techniques using Neural Networks.

Classification of face recognition method:



FLOWCHART FOR THE PROPOSED SYSTEM:



3.1 SYSTEM ARCHITECTURE :-

Enrollment:

The student or person will be enrolled to the database using their general information and unique biometric features.

The enrollment includes:

- Taking image by camera
- Enhancement of that image
- Feature extraction
- Maintain Database

Image Acquisition:-

The camera device will capture the image this captured image is given as an input to the system.

Enhancement :-

The image that is captured from the camera device sometimes may have the brightness in that which needs to be removed for the appropriate result. The Captured image is converted to grayscale image for the enhancement

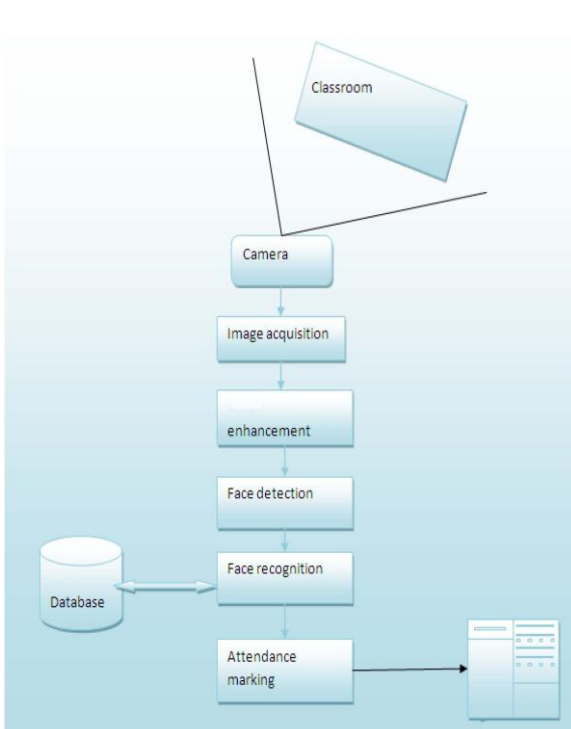


Fig -4: System Architecture

Image Acquisition:-

The camera device will capture the image This captured image is given as an input to the system.

Enhancement :-

The image that is captured from the camera device sometimes may have the brightness in it which needs to be removed for the appropriate result the Captured image is converted to grayscale image for the enhancement

Noise Removal: When the input image is captured by camera, it may contain the noise that has to be filtered from image.

Face Detection: After the enhancement of image, the image comes to face detection module. This module will detect the faces of students from image using PCA algorithm.

Face Recognition: Face recognition is the next step after face detection. The face recognition can be achieved by cropping the faces from the image and comparing them with the enrolled images in the face database.

Attendance: After the verification of faces and successful recognition is done, the attendance will be marked on the server.

3.2 HARDWARE REQUIREMENT

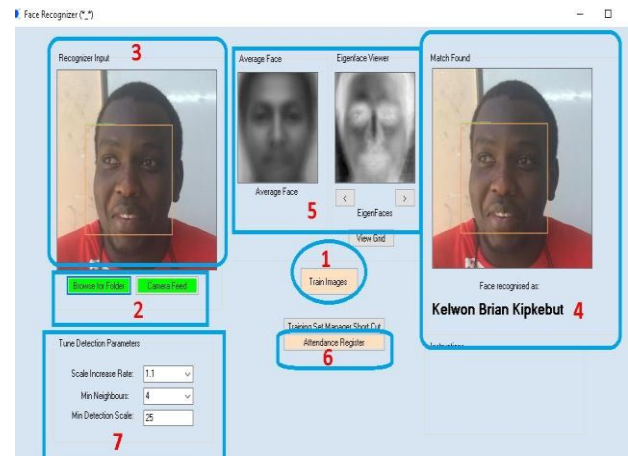
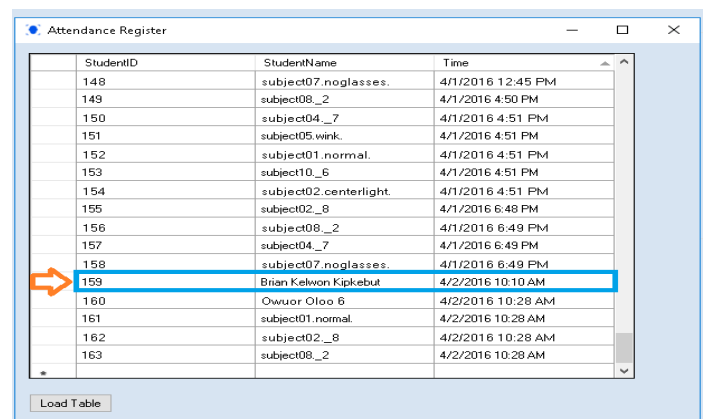
- 1.66 GHz Pentium Processor or Intel compatible processor.
- 2GB RAM.
- 80 GB free hard disk space.
- Web Camera.



3.3 SOFTWARE REQUIREMENTS

- Visual Studio 2010(.Net framework)
- MS SQL Server 2008.

4. RESULT ANALYSIS

StudentID	StudentName	Time
148	subject07.noglasses.	4/1/2016 12:45 PM
149	subject08_2	4/1/2016 4:50 PM
150	subject04_7	4/1/2016 4:51 PM
151	subject05.wink.	4/1/2016 4:51 PM
152	subject01.normal.	4/1/2016 4:51 PM
153	subject10_6	4/1/2016 4:51 PM
154	subject02.centerlight.	4/1/2016 4:51 PM
155	subject02_8	4/1/2016 6:48 PM
156	subject08_2	4/1/2016 6:49 PM
157	subject04_7	4/1/2016 6:49 PM
158	subject07.noglasses.	4/1/2016 6:49 PM
159	Brian Kelwon Kipt-ebut	4/2/2016 10:10 AM
160	Owuior Oloo 6	4/2/2016 10:28 AM
161	subject01.normal.	4/2/2016 10:28 AM
162	subject02_8	4/2/2016 10:28 AM
163	subject08_2	4/2/2016 10:28 AM

The face recognizer compares the input face in the image captured with the faces captured during enrollment. If it is a match, it then retrieves the name associated with the input face.

Step 1 is to train the recognizer to be able to identify a face. Step 2 selects the source of the image with the face to be recognized. The input image with the face is then displayed in the recognizer picture box 3.

The name of the input face in the image is then displayed as shown in Step 4.

The highlighted step 5 displays the computed average and Eigen faces.

The returned name of the input face, date and time are then utilized in populating the records in the attendance register database. Clicking the button of step 6 displays the register as shown in Figure feed.

5. CONCLUSION

Attendance automation using face recognition is a non-intrusive method and it helps the management to maintain an accurate attendance database as the test image is an accurate database as the test image is passed through different levels.

It can be a reliable, secure, fast and an efficient class attendance management

System which has been developed by replacing a manual and unreliable system.

This face detection system will save time, reduce the amount of work done by the administration and replace the stationary material currently in use with already existent electronic equipment.

A crucial role is played by camera in the working of the system hence in real time scenario the image quality and performance of the camera must be tested.

6. REFERENCES

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