

Student Attendance System by Face Detection

Abhinav Mishra¹, Aditya Kumar², Prof.Ashutosh Pandey³

^{1,2,3}Computer Science and Engineering, ABES Institute of Technology, Ghaziabad, India

Abstract-*The uniqueness or individuality of an individual is his face. In this project, a person's face is used for automatic presence. Student attendance is very important for every college, university, and school. The methodology of conventional attendance can be called registration of student names or number of roles and recording of attendance. Spending time for this purpose is an important concern. Suppose the duration of the topic is approximately 60 minutes or 1 hour and that after the session it takes 10 to 15 minutes. For every teacher, it's long-lasting. In order to avoid these losses, an automated process based on image processing is used in this project. In this project, face recognition and facial recognition are used. Face detection is used to determine the position of the face, and face recognition is used to draw attention to the repression. The database of all students in the class is stored and when the individual student's face is present on one of the persons stored in the database.*

Key Words: Image processing, Face Recognition, Face Detection, Principal Component Analysis (PCA), Eigen Face.

1. INTRODUCTION

Maintaining participation in all learning institutions is important to monitor student performance. In most learning institutions, students receive a list of attendances issued by department heads as part of the regulations. Students record these forms and then enter or manually enter the computer for future analysis. This method is annoying, time consuming and inaccurate because some students often sign their absent colleagues. This approach also makes it difficult to find individual students in a large classroom environment. In this project, we propose a design and use of a face detection and recognition system that automatically allows students to keep abreast of lectures in the classroom and mark their presence by identifying their faces.

While other biometric methods (such as iris scans or fingerprints) may be more accurate, students often have to wait a long time when they enter the classroom. Face recognition is chosen because of its non-invasiveness and familiarity, as people identify others based primarily on their facial function. The (face) biometric system will include a

registration process in which the unique features of the face are stored in a database, followed by an identification and verification process. The face in the detected image (obtained from the camera) is compared to the previously saved face captured in the project.

2. LITERATURE SURVEY

Digital image processing is essentially digital image processing. Digital imaging technology is driven by three main applications:

- 1 Improve the image information of human perception
- 2 Image processing for automatic machines
- 3 Efficient storage and transfer.

2.1 Human Perception

This application employs a method to improve image information for human interpretation and analysis. Typical applications include: Noise filtering content enhancement is mainly contrast enhancement or anti-blur and remote sensing.

2.2 Machine Vision Applications

Here, attention is focused on processing of extracting image information suitable for computer processing. Typical applications are included.

- Industrial machine vision for product assembly and inspection.
- Automated target detection and tracking.
- Finger print recognition.
- Weather processing and mechanical processing for aerial and satellite images that crops evaluate.

Facial detection and recognition falls within the machine vision application of digital image processing.

3. WORK FLOW

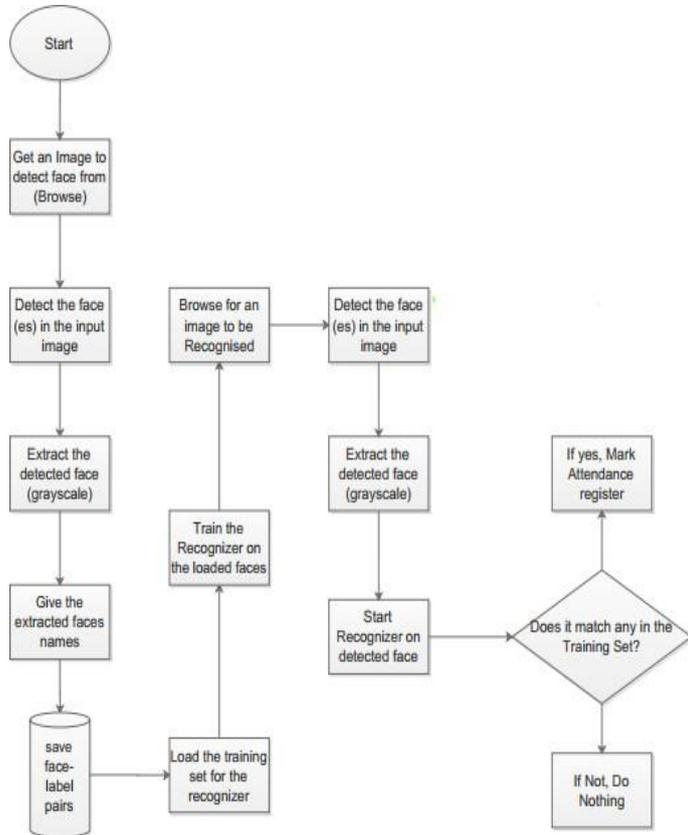


Fig -1: Flow Diagram

3.1 Methodology

Given an unknown face of the same size as the training set of M images, the PCA eigenface method, as shown, intends to represent the face image as a linear combination of a set of eigenfaces / feature vectors. These Eigenfaces (eigenvectors) are in fact the principle components of the training set of face images generated after reducing the dimensionality of the training set. Once Eigenfaces are selected, each training set image is represented in terms of these eigenfaces. When an unknown face comes for recognition, it is also represented in terms of the selected eigenfaces.



Fig -2: A training set consisting of M images

3.2 Data set creation

For the database we have to capture the photos of our webcam or the external camera. To do this, based on the camera we use, we need to install the library from the website www.opencv.org on the OpenCV website. Then we need at least 500 to 1000 captures to get a higher percentage of our due and to achieve the goal we are making in this project. We can store information on the form of separate folders, which separates each person from others.



Fig -3: Dataset

3.3 Data set Training

Training is given so that picture captured by webcam or the external camera is trained. Here we tell that a specific picture is associated to a particular label. That label is unique about that picture. Whenever that picture come across that unique label is projected or that picture is identified.

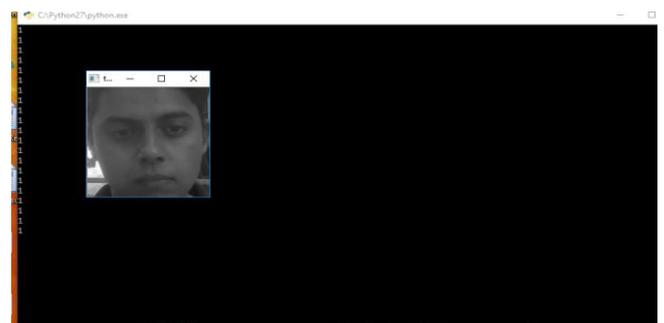


Fig -4: Training Dataset

Here in Fig 4 we can see that that data set is being trained and unique id given to data set is 1.

3.4 Face Detection

Face Recognizer compares the face for recording on an image recorded with people recorded during the recording. If it matches, it gets the name associated with the person to enter. Face detection we can do it using the cascading class of the object and we use the b-box method. The face detection system that uses the cascade installation was

purchased with the most popular face recognition model, Viola Jones. These are some of the objects present. These are in the form of small blocks that contain them. They are passed through an image and move through each block of images and they are checked if they overlap. First we will convert the gray-gray-gray-gray image. The faces of the captured image are collected. The captured faces are cut into small resolution images of 114x94 resolution. It must be around 15 KB.

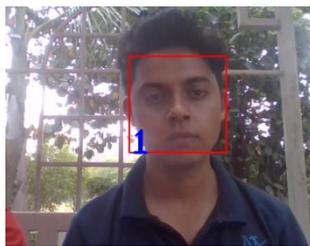
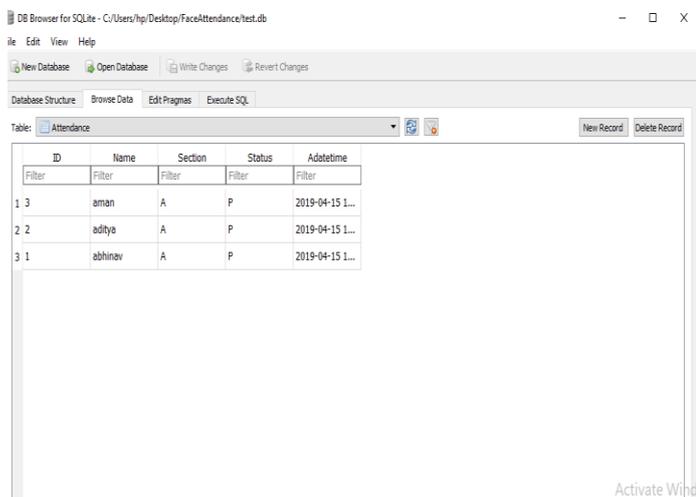


Fig -5: Detected Face

Here in Fig 5 we can see that face is associated with unique id 1.

3.5 Result



ID	Name	Section	Status	Adatetime
1 3	aman	A	P	2019-04-15 1...
2 2	aditya	A	P	2019-04-15 1...
3 1	abhinav	A	P	2019-04-15 1...

Fig -6: Result saved in database

In Fig 6 we can see that at number 3 ID 1 is saved with name labelled "Abhinav" of section 'A' is present which is denoted by 'P'.

3.6 Conclusion

It can be concluded that a reliable, safe, fast and efficient classroom management system has been developed that replaces a manual and unreliable system. This facial recognition and recognition system saves time, reduces

administration and replaces the office equipment currently used with existing electronic devices.

No special hardware is required to install the system as only one computer and one camera are used. The camera plays a crucial role in the performance of the system. You should therefore test the image quality and performance of the camera in real time, especially if the system is powered by a live camcorder.

The system can also be used in licensed and authentic access control systems (availability of accessibility), personal security video surveillance systems or law enforcement.

The main threat to the system is spoofing. For future updates, anti-spoofing techniques, such as eye detection, can be used to distinguish directly from static images when facial images taken from a class undergo facial recognition. Of the overall system efficiency (80.1%), human intervention may be required to make the system unique. In this way, you can add a module that converts all unidentified faces and can be manually corrected by the teacher.

Future tasks include adding well-structured help records for each class, as well as the ability to create monthly support reports and automatically submit the same eligible reviewers.

REFERENCES

- [1] C. Kotropoulos and I. Pitas, "Rule-based face detection in frontal views," Proc. Int'l Conf. Acoustics, Speech and Signal Processing, vol. 4, pp. 2537-2540, 1997.
- [2] G. Yang and T. S. Huang, "Human face detection in complex background," Pattern Recognition Letter, vol. 27, no.1, pp. 53-63, 1994.
- [3] Muhammad Fuzail, Hafiz Muhammad Fahad Nouman. Muhammad Omer Mushtaq, Binish Raza Awais Tayyab, Muhammad Waqas Talib. "Face Detection System for Attendance of Class Student". International Journal of Multidisciplinary Sciences and Engineering, Vol.No.5, 4, April 2014.
- [4] Dayanand S. Shilwant, Dr. A. R. Karwankar. "Student Monitoring by Face Recognition System". International Journal of Electronic, Communication & Soft Computing Science and Engineering (IJECSCE) ISSN 2277-9477, Volume 2, Issue 2.

[5] T. Matthew and A. Pentland, Eigenfaces for Recognition, vol. 3, Volume 3, Number 1 vols. Vision and Modelling Group, The Media Laboratory, MIT: Journal of Cognitive Neuroscience, 1991.

[6] Anil K Jain, Lin Hong, Sharath Pankanti, and Ruud Bolle, Biometric Identification. IEEE, 2004.

[7] Balwant Singh, Sunil Kumar, Paurush Bhulania “Lecture Attendance System with Face Recognition and Image Processing”. International Journal of Advance Research in Science and Engineering IJARSE.Vol. No.2, Issue No.3, March, 2013.

[8] Seema Rao and Prof.K.J.Satoa, “An Attendance Monitoring System Using Biometrics Authentication”, International Journal of Advanced Research in Computer Science and Software Engineering, Volume 3, Issue 4, April 2013, ISSN: 2277 128X.

[9] P. Viola and M. J. Jones, “Robust real-time face detection,” Int. J. Comput. Vis., vol. 57, no. 2, pp. 137–154, 2004.

[10] Jomon Joseph, K.P.Zacharia, “Automated Attendance Management System using Face Recognition”, international Journal of Science and Research, Volume 2 Issue 11, November 2013.