

# Attendance Tracking System using Image Processing

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## Abstract

The attendance system in school and colleges is considered as significant because it shows the sincerity of the students towards their studies. The attendance system in many institutions is maintained by marking student's attendance in an attendance register. It consumes loads of time and

physical work from faculty. Time used for attendance taking can be used by both students and faculty to give out more information regarding studies. So, an automated system is proposed in this paper.

**Keywords**— FaceDetection, Face Recognition, Viola-Jones algorithm, Alignment - free Partial face recognition algorithm

## I. Introduction

Many challenges are present for recording student's attendance such as it requires more time which can be used more creatively by faculty to educate students. There is also chances of losing registers and errors while taking attendance. Students may cheat faculties by giving fault information. By making use of computerized system we solve these problems. Human intervention is reduced by making use of this system. The technique of Face recognition has got attention in many areas of development. To solve the problems occurring in traditional attendance system this concept can be used. An attendance system which can recognize the faces of the students is developed in this project. It saves lots of time which is required in the present system. Error occurrence in attendance computation can be resolved by making use of this system. [16]

In many educational institutions keeping track of student attendance is one of the troublesome tasks. Different methods of attendance taking has been adopted by many educational organizations such as maintaining attendance register, usage of thumb impression or eyeball of students. Even usage of such methods also requires more time and there may be chances of error in attendance recording. Most of the attendance monitoring is done by making use of attendance register where faculty records attendance of the present student in the classroom. There are chances of error occurrence while taking attendance and it also requires more time. Attendance registers may get stolen in order to erase the information so, these methods are not reliable.

Biometrics is one of the methods which is used in attendance taking [12], this method involves gathering student's fingerprints and storing them in the database. To register a student into the database the fingerprint of such student should be taken. Taken fingerprints should be matched with the already existing data in the database if there are same then attendance will be marked for that student as present. This method may have some disadvantages such as students need to wait by forming a line which is very time consuming and chances of marking absent is also there if the fingers are not perceived properly in fingerprint sensor.

One more method used is eyeball recognition method. This method stores features of the eyeball of every student in the database and they are compared to mark attendance of the students. If a classroom consists of huge members of students, this method cannot be applied in such cases, so these methods have disadvantages.

These disadvantages can be eliminated by usage of an automated attendance system is needed will carry out the functionality in more efficient manner.

## II. Related Work

Student attendance in many institutions are recorded in traditional ways such as by using attendance registers and calling students name or register number to mark their attendance as present or absent. Attendance information should be calculated and stored in computers to find out the

percentage of their attendance which is one of the pre-requisites for the completion of a successful year or a semester. This system is prone to error since there is need to store large amount of information in a shorter period. [1]

In [2] Many biometrics-based attendance recordings is introduced. It consists two types such as of fingerprint recognition and eyeball detection. In the foremost method fingerprints of all the students are listed in the database and to capture the attendance if the student's fingerprint matches with existing data then it will be marked as present. In the second method the eyeball features of a student are stored in database and if student's features match with existing data in database then it will be marked present for that student. This system has many disadvantages, it requires more time and error may occur if student doesn't co-operate with the system.

In [3] authors present an outline of face recognition and examine the procedure and its working. From there on they speak to the latest face recognition strategies posting their points of interest and hindrances. Few methods determined here additionally improve the productivity of face recognition under different brightening and appearance state of face pictures. keywords- face recognition, Eigen faces, fisher faces, neural system, elastic bunch method, chart coordinating, highlight coordinating and format coordinating.

In [4] writers explain FRT (Face Recognition Technology) i.e. FRT progressively moves from the examination research facility into the universe of socio-political concerns and practices there is a need to connect the partition between a simply specialized and a socio-political investigation of FRT. This is the point of this report. In doing this the report tends to the remarkable difficulties and worries that go to its turn of events, assessment, and explicit operational uses, settings, and objectives. It features the potential and impediments of the innovation, taking note of those assignments for which, it appears to be prepared for sending, those zones where execution hindrances might be overwhelmed by future mechanical turns of events or sound working systems, and still different issues which seem unmanageable.

In [5] the concept of visual object detection is explained which helps in high detection rate of the images. It depicts the techniques of face recognition which consists of three key areas such as Integral Image which helps in capturing

features of the faces. AdaBoost which helps in yielding classifiers and consolidating composite classifiers.

[6] Authors present a guess about face recognition dependent on mental investigations and exercises gained from planning calculations. This guesses that various instruments are associated with human recognition of natural and new faces. For instance, it is conceivable that 3D head models are developed, by broad preparing for recognizable countenances, yet for new faces, Multiview 2D images are put away. This suggests that likelihood thickness capacities for natural countenances, while for new faces just have discriminant capacities. [7] Portrayal of the attendance without human impedance is explained. In this strategy the camera is fixed in the homeroom and it will catch the image, the countenances are identified and afterward it is perceived with the database lastly the attendance is checked.

[8] It introduces an attendance system using Arduino and raspberry pi. In this system attendance is recorded by using Arduino and raspberry pi is used to store that information such as server. It involves Zigbee mechanism to transfer attendance details into the server.

In [9], presenters endeavour to actualize a unique mark and face detection and acknowledgment biometrics system for the teachers' attendance management in this manner supplanting the present manual system. Proposed system gives personnel face acknowledgment utilizing Viola-Jones Method coordinated with unique mark confirmation utilizing Arduino. Test results improved attendance system exactness and robotize personnel attendance system. The objective of authors in [10] is to program an attendance system through face recognition. Difficulties for face recognition like facial articulations, change in haircuts, the nearness of some object or power of light can be handled. The proposed system is tried on students at school grounds and system distinguishes faces at an exceptionally quick rate with precision 99.3% utilizing Dlib and face recognition libraries.

In [13] briefs how researchers consider image processing as one of the vital areas to work on. One of the main areas of image processing involves face recognition. The different challenges of that mechanism are explained well in a chronological manner.

In [14] authors explain different face recognition techniques in that Eigen face detection is one of them. Eigen face detection is one appreciated method which identifies and

notices the features of face. The algorithm of this technique works well in good light conditioned mode and gives accurate results in less time. It needs more space since the projection matrix is created for each image.

### III. Purpose

The project purpose is to develop an automated system which will make use of face detection and face recognition techniques to store the attendance by taking a classroom image. By using this system time consumption required for attendance marking can be saved and students cannot cheat by giving proxy. Students images are registered in the system who are newly joined to schools or colleges with their ID and name. Attendance in this system is recorded by capturing the classroom image in which faces of the students are recognized with respective to their ID and names. The details of the student's attendance are stored in an excel sheet along with date and time

### IV. Proposed System

This project is executed in four modules such as face detection of students which will store images of the students, labelling the detected faces which will label each image with an ID, training a classifier which will differentiate between the images of the students which are captured and face recognition is used to mark attendance in the system which will compare the faces captured in the classroom image with the images stored in the database.

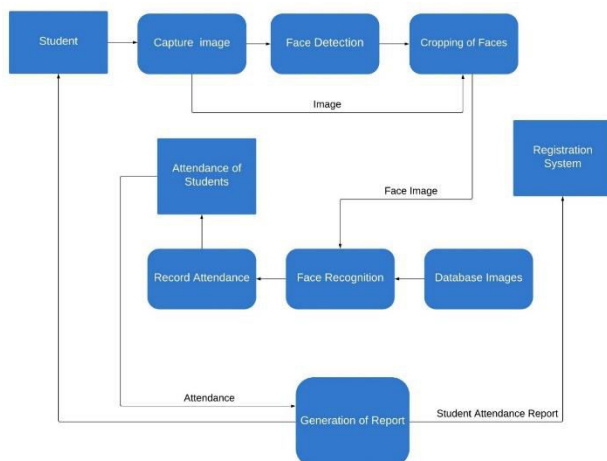


Figure. 1. Flow Chart of Proposed Methodology

Figure 1 Image of a student is captured, and features of the face are detected then trained with labelling the dataset. The

dataset consists of unique ID of student to monitor attendance taking feasibly. To take attendance input image of a classroom should be taken. Attendance of students are taken using face recognition technique. The attendance monitoring is done by generating an attendance report using excel sheet in which details of students are stored along with time and date. If any student is present whose details are not added to database, then it will be detected as unknown.

### V. Implementation

To execute the facial recognition monitoring attendance system, rules must be followed under certain methodologies. Confined phases should have been achieved for this method. These phases are as per the following: Phases for attendance monitoring system based on Face Recognition:

**Enlisting with remarkable IDs:** Person or student is enlisted with their general information to the database. This information is saved for further processing. The image of individual is captured utilizing camera and helps in utilizing calmer filtration and histogram equalization. After this phase, features are extracted. In this manner, remarkable features will be kept in the database along with their novel ID.

**Image Acquisition:** A camera gadget of superior quality is mounted in the classroom. Camera captures images of the classroom. These held onto images is considerate as contribution for the system.

**Grayscales conversion of images:** The images captured from the camera may have splendour issues in it, which ought to have been evacuated for suitable result. Subsequently, for enhancement held onto images are re-established to grayscale images as shown in figure 2.



Figure2. Greyscale conversion of images

**Face Detection:** After the images are enhanced, images go for the face detection phase. This phase is used to identify faces of each student.

**Face Recognition:** Face-Recognition is succeeding phase after face-detection. For this, faces are being edited and selection of area of intrigue is picked.

**Attendance Marking:** After the faces being effectively checked and perceived, the attendance would be noted the excel sheet which consists of ID, name of the student. It also consists of date, time and attendance status.

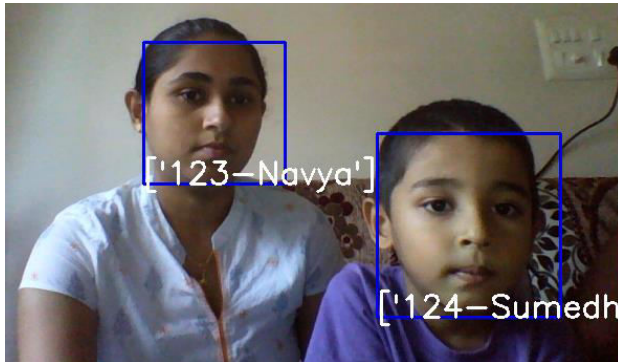


Figure3. Attendance Marking

## VI. Conclusion

Nowadays many attendance monitoring systems might be adopted in various educational institutions. Biometrics systems are one of them. Even though such systems are considered as automatic there are chances of getting errors in those systems so, there is need for a consistent attendance system.

This project helps in achieving a secure environment. Facial recognition has great advantage in the field of education. It can be used to update and manage the attendance automatically in a secured way when compared to traditional methods. It helps the school experts in lessening labour required to take care of the attendance. Attendance is maintained by generation of excel sheet which contains student details such as ID, name of student, date, time of excel sheet generation and status of the attendance. This system ensures in attaining accurate attendance report.

## VII. Future Enhancements

- To enhance the recognition rate of system when there are unintended changes in a student such as bald head, using scarf, growing beard etc.
- Centralized server can be introduced in which attendance of the different departments or whole

institution can be stored. It increases security of the system.

- Time efficiency of the system can be increased which ensures that students must come to classes within given time otherwise attendance for late comers will be marked as absent.
- Attendance report generation can be implemented. Such reports will be directly shared with parents, it reduces the necessity of sending attendance status of students to their parents.

## VIII. References

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