



# CLOUD BASED STUDENT ATTENDANCE TRACKING SYSTEM

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## Abstract

The administration of biometric attendance is the topic of this essay. Automatic attendance management will take the place of the manual system, which is time-consuming and challenging to maintain. Although there are several biometric procedures, face recognition is the most effective one. We are employing the Convolutional Neural Network (CNN) technique, which is based on Deep Learning (DL). We are taking into consideration the dataset of human faces that was trained using CNN. For the user interface webpage, the flask framework was used, and the entire procedure was carried out in the public cloud (AWS).

**Keywords:** Attendance Management, Computer Vision, Deep Learning, Human Face Images.

## 1. INTRODUCTION

### 1.1 Introduction

Biometrics are measurements of the body and computations of human traits. In computer science, access control and identification are done via biometrics authentication (also known as realistic authentication). It is also used to locate people in groups that are being watched. The distinct, quantifiable traits that are used to identify and categorize people are called biometric identifiers. Physiological traits that are connected to a person's physical attributes, such as body form, are

frequently classified as biometric identifiers. Examples include fingerprint, palm vein, facial recognition, DNA, palm print, hand geometry, iris recognition, retina, odor/scent, and palm veins, among others. Behavioral traits, such as typing rhythm, gait, keystroke, signature, behavioral profile, and voice, are connected to a person's pattern of behavior. The phrase was created by some researchers. The latter category of biometrics is known as "betamimetics." Token-based identity systems, like a passport or driver's license, and knowledge-based identification systems, like a password or personal identifying number, are more conventional methods of access control. Since biometric identifiers are specific to each person, they are more reliable than token- and knowledge-based approaches for confirming identity. However, collecting biometric identifiers raises privacy issues regarding how this data will be used in the future. Use of biometrics correctly depends heavily on the application. Based on the desired levels of convenience and security, some biometrics will be superior to others. Every feasible application will not be able to be satisfied by a single biometric. The two fundamental operating modes of a biometric system are shown in the block diagram. To confirm the person is who they say they are, the system first performs a one-to-one comparison of a captured biometric with a specified template stored in a biometric database in verification (or authentication) mode. The verification of a person takes three steps. All users' reference models are created in the first stage and kept

in the model database. The second phase involves matching some samples to reference models to create the real and fake scores and figure out the threshold. The testing phase is the third step. A smart card, username, or ID number (such a PIN) may be used in this process to specify which template should be used for comparison. The verification mode is frequently used in "positive recognition," where the goal is to stop numerous people from using the same identity.

## 2. Literature Survey

**[1] Naveed Khan Balcoh, M. HaroonYousaf, Waqar Ahma and M. Iram Baig :** The chore of recording students' attendance in class is crucial and takes a lot of time if done manually. For this reason, a variety of automatic techniques, such as biometric attendance, are available. All of these techniques are time-consuming since students must line up to place their thumbs on the scanning gadget. The effective algorithm that marks attendance automatically and without human intervention is described in this paper. The method for recording attendance is to use a camera mounted in front of the classroom to continuously capture photos of the students, identify faces in those images, compare the identified faces to a database, and mark the attendance. It is crucial to take students' attendance in class, but doing so manually takes a lot of time. For this reason, a variety of automatic techniques, such as biometric attendance, are available. All these techniques are time-consuming since students must line up to place their thumbs on the scanning gadget. The effective algorithm that marks attendance automatically and without human intervention is described in this paper..

**[2] NirmalayaKar, MrinalKanti Debbarma, Ashim Saha, and Dwijen RudraPal:** The control of the system in computer-based communication is significantly impacted by authentication. Human face recognition is a crucial area of biometric verification that has found widespread usage in a variety of fields, including network security, human-computer interface, door control systems, and video monitor systems. This article describes a technique for the Student Attendance System that will use the Personal Component Analysis (PCA) algorithm to interact with facial recognition technology. The system will automatically keep track of students' attendance in a classroom setting and will give

faculty members the ability to conveniently access student data by keeping a log of their clock-in and clock-out times. This article offers a technique for integrating the facial recognition technology into the student attendance system using the Personal Component Analysis (PCA) methodology. The system will automatically keep track of students' attendance in a classroom setting and will give faculty members the ability to conveniently access student data by keeping a log of their clock-in and clock-out times.

## 3. OVERVIEW OF THE SYSTEM

### 3.1 Existing System

To collect attendance using the current technique, which is time-consuming and requires a person's finger print, organizations typically utilize biometric systems. There are situations when the finger print cannot be detected, which can interfere with taking attendance.

#### 3.1.1 Disadvantages of Existing System

- Time taking.
- Sometimes failed in detecting the finger print.
- Cannot be used properly for biometrics.

### 3.2 Proposed System

We have developed a model in this paper that can use face recognition to take a student's attendance during the designated times; if the student is not recognized during the designated time, they will be marked as being late. The model can also send SMS notifications to parents of students about the timings of their attendance. Although there are several biometric procedures, face recognition is the most effective one. Here, we're utilizing computer vision, a branch of deep learning, to receive and write data from the camera while using Flask to build a graphical user interface. And the public cloud server is where the entire process is developed.

### 3.3 Methodology

In this project work, I used five modules and each module has own functions, such as:

1. System Module

## 2. Student Module

### 3.3.1 Enter Data:

Add the details like Roll number and Name and parent mobile number.

After entering the details click on the image capture button.

### 3.3.2 Data Gathering:

After clicking the capture button the web cam will be opened for taking images and it captures 200 frames, after completion of taking images web cam will be automatically closed.

### 3.3.3 Training:

All captured images are stored into a Training image folder. For training we use LBPHFaceRecognizer\_create() method which is used for recognizing the face features and we use CNN algorithm for classifying the faces. After training with CNN, the model will be saved in to directory.

### 3.3.4 Testing and taking Attendance

Whenever a student made a click on the button provided, a web cam will gets opened.

The web cam has ability to capture the image of the particular students face and then the image is converted into greyscale and it undergoes for scaling

The scaled image is converted into the form of vectors with the help of LBPHFaceRecognizer\_create

Now the converted data will be helpful to predict the outcomes.

There are 4 conditions to collect the attendance

1: Before 10AM – Early come    2. After 10AM – Late

3. Before 4PM – Early out    4. After 4PM- Normal out

After checking the conditions data will be stored into AWS Server. And system automatically send a SMS to student parents through mobile regarding timings of attendance.

### 3.3.5 Student Module

#### STUDENT

#### Take Attendance

Student attendance will be captured through web cam which was installed and will be capturing continuously.

Once after recognizing face of a student data will be stored in server and it will send a sms to student parent.

Here student can select the options like take attendance button then only system can access the attendance. After that system stores the information into MYSQL database.

#### View Attendance

After entering the roll number student can view their attendance details.

## 4 Architecture

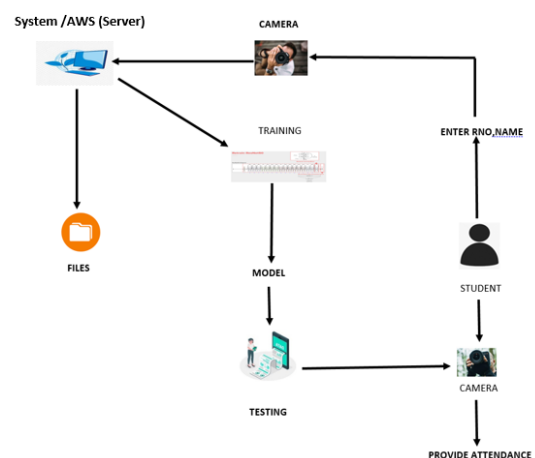
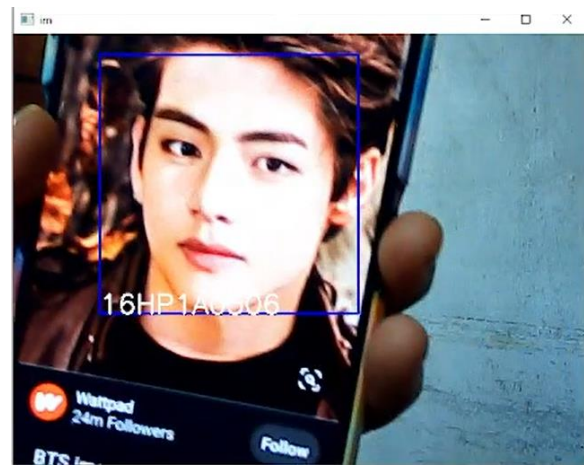


Fig 1: Frame work of proposed method

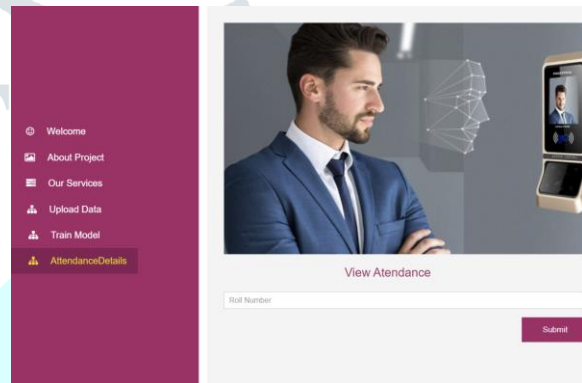
Above architecture diagram shows three stages of data flow form one module to another module. Data collection, preprocessing, and algorithm training.

## 5 RESULTS SCREEN SHOTS

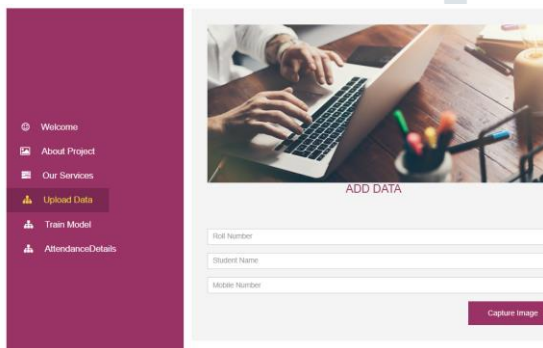
### Home Page:



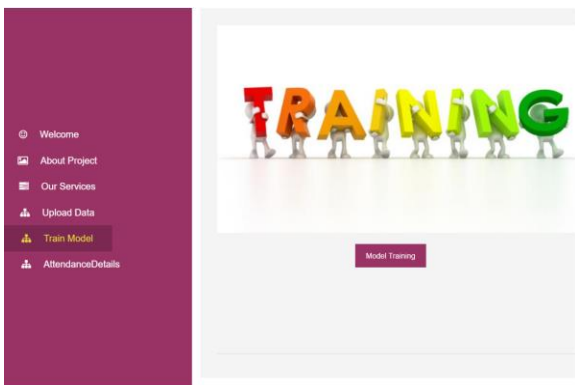
### View Attendance:



### Add Data:



### Train Model:



### Take Attendance:

## 7. CONCLUSION

✓ In our proposed work, we have developed a model that can record student attendance at designated hours using facial recognition; if a student is not recorded during designated times, their attendance will be recorded as tardy. We used the Flask Framework, where the student's data were stored, a model was trained, the student's photo was taken, it was tested, and the student's attendance was tracked using the face image that was taken. Additionally, the entire process is hosted in the public AWS cloud.

### Future Enhancement

✓ This can be used in the future to readily define the sorts of different infections, making it easier to identify infections in their early stages and cure them.



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