# Face Recognition Based Automated Attendance Management System

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Keywords: Face Detection; Face Recognition; Attendance System; Computer Vision; OpenCv; Education Technology; Facial Authentication

*Article*

# Face Recognition Based Automated Attendance Management System

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**Abstract:** Attendance is an important aspect of the daily classroom evaluation. When using traditional methods such as calling out roll calls or taking a student's signature, managing attendance can be a time-consuming task. The teacher normally checks it, although it's possible that a teacher will miss someone or some students' answers many times. Face recognition-based attendance system is a solution to the problem of recognizing faces for the purpose of collecting attendance by utilizing face recognition technology based on high-definition monitor video and other information technology. Instead of depending on time-consuming approaches, we present a real-time Face Recognition System for tracking student attendance in class in this work. The suggested method included identifying human faces from a webcam using the Viola-Jones technique, resizing the identified face to the desired size, and then processing the resized face using a basic Local Binary Patterns Histogram algorithm. After the recognition is completed, the attendance will be immediately updated in a database with the relevant information. Many institutions will profit greatly from this endeavor. As a result, the amount of time it takes and the number of human errors it makes are minimized, making it more efficient

**Keywords:** face detection; face recognition; attendance system; computer vision; OpenCv; education technology; facial authentication

## Introduction

Many scientific discoveries and technologies have occurred in this modern period of automation to save manpower, improve accuracy, and improve our lives. The breakthrough in the field [1] of automation replacing conventional attendance marking activities is known as an Automated Attendance System. Biometric, smart-card, and web-based Automated Attendance Systems are the most common types. These systems are frequently employed in a variety of businesses. When the strength is greater, the traditional method [2] of attendance marking becomes exceedingly time consuming and cumbersome. Automation of attendance systems has an advantage over traditional methods in that it saves time and can also be used for security [3]. This also aids in the prevention of bogus attendance. A facial recognition system is a computer programme that takes many images of a person and stores the data about that person's face so that when that person appears in front of the camera again, it can verify that person [4].

### *Related Work*

There are a number of existing systems that are closely analogous to the proposed idea of using official recognition techniques and algorithms to indicate attendance in a class. A literature survey of the proposed systems was conducted to analyze these systems. The proposed case study was built around a few key sources in the field of facial recognition and image processing. Using the other design methodologies, a descriptive framework was created [5]. This type of system makes [6] use of the RFID [7] technology and the SURF algorithm to create a student attendance control system. The SURF directly modifies the scale of box features to implement the scale space using box filter and

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integral image, similar to how SIFT produces a pyramid scale space and continually smooth's the image with Gaussian and then sub samples the image

*Existing Problem*

This project is being carried out due to the concerns that have been highlighted on the methods which lectures use to take attendance during lectures. The use of clickers, ID cards swiping and manually writing down names on a sheet of paper as a method to track student attendants has prompted this project to be carried out. This is not in any way to criticize the various methods used for student attendance, but to build a system that will detect the number of faces present in a classroom as well as recognizing them.

Also, a teacher will be able to tell if a student was honest as these methods mentioned can be used by anyone for attendance records [8], but with the face detection and recognition system in place, it will be easy to tell if a student is actually present in the classroom or not. This system will not only improve classroom control during lectures, it will also possibly detect faces for student attendance purposes.

*Components*

1. Attendance Face Recognition Algorithm: This is the core component of the system, responsible for identifying and verifying the facial features of an individual with those stored in the system's database.
2. Camera:A high-resolution camera is used to capture images of individuals' faces.This camera can be mounted at strategic locations, such as entrances or exits, to ensure that all attendees are captured.
3. Database:The system's database stores the facial features of all registered individuals.This database is used to compare the captured images with the stored features to determine if the individuals are present in the system.
4. Display: A display screen or monitor is used to show the system's status, such as whether an individual has been detected and marked as present or absent.

## Experiments and Results

The step of the experiments process are given below:

1. Registration: We need to register their facial features in the system's database. This can be done by taking a photo of their face and storing it in the database.
2. Capture: When an individual enters or exits the premises, their face is captured by the camera.
3. Comparison: The captured image is compared with the images stored in the database to find a match.
4. Verification: If a match is found, the system verifies the student's identity by comparing their facial features with the stored features.
5. Recording: If the verification is successful, the system records the individual's attendance status in the database.
6. Save: The system saves in the excel sheet the status of the Student's attendance with the time, whether they have been present or absent.

In this picture shown when a student appears on camera it is compared with the images stored in the database to find a match.

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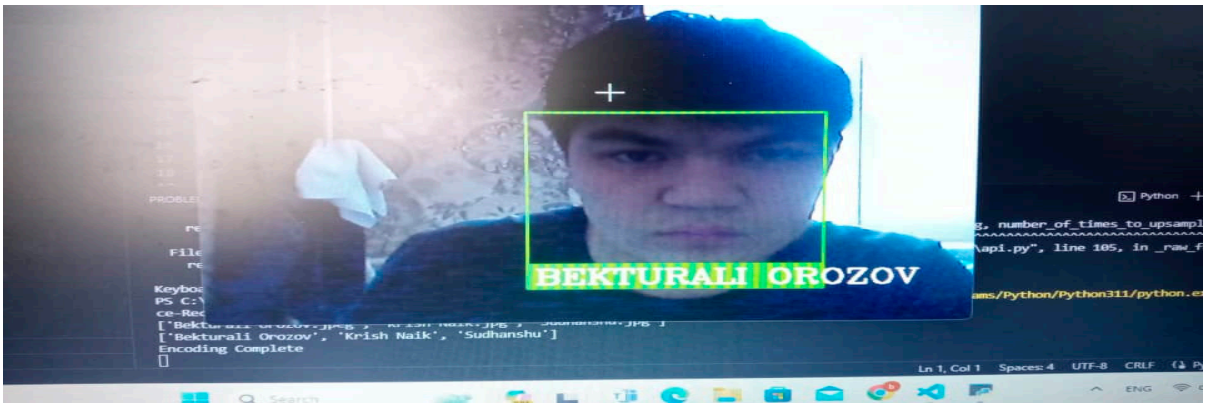


| | Name | Time |
|---|---|---|
| 2 | | |
| 3 | Bekturali | 14:24:01 |
| 4 | Bekturali | 14:24:01 |
| 5 | Bekturali | 14:24:01 |
| 6 | Bekturali | 14:24:01 |
| 7 | Bekturali | 14:24:01 |
| 8 | Bekturali | 14:24:01 |
| 9 | Bekturali | 14:24:01 |

## Conclusions

Attendance marking in a classroom during a lecture is not only an onerous task but also time consuming. Due to an unusually high number of students present during the lecture there will always be a probability of proxy attendance. Automatic Face Recognition (AFR) has created a revolution in this changing world. It has ensured us with more safety of our data. Smart attendance using Face Recognition comes handy in day to day activities. It helps reduce the amount of paper and efforts for manual attendance. It is a process which students face to recognize them. It is done by using face biometrics and some other features of the face. It is captured and stored in the memory and it's been processed to recognize the student by using various algorithms and techniques. In our attendance system, the computer will be able to recognize the student whose data has been stored and it marks attendance of that student. Various algorithms and techniques have been used for improving the performance of face recognition.

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