

**Symbiosis Institute of Technology**

# SMART

# ATTENDENCE SYSTEM

**“A Single App Ensuring All Attendance Needs”**

MORE RELIABLE MORE EFFICIENT MORE ADVANCED

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# Abstract

To maintain a discipline and let students grasp utmost knowledge in schools, colleges and universities the attendance system was introduced. There are two common ways to record students' attendance in a particular lesson. The first one entails calling the roll number, and the second one involves having the pupils sign a piece of paper next to their roll number. Therefore, it was necessary to develop this system so that it could be more user-friendly, time-saving, and effective. it will help to save time and efficiently identifies and eliminates the chances of proxy attendance. This automatic technology [1] helps the teacher take the class's attendance without being interrupted or wasting time. The main purpose of this project is to build automated attendance system using Eigenface technique with DB/Python libraries and recognizer algorithm have been implemented The concept can be applied in many different ways, one of which is facial identification, [2] which will save time.

# Introduction

During this era of technology and automation we are still using the same old ways of classroom management. In [2] current scenario, marking attendance in the class session of the students are the essential tasks of the subject teachers, since marking the attendance can regulate the students to attend the sessions and verify the number of students in the class. The management and maintenance of student information is a key task for any institution. [3] To make this smooth we need something which can make this proper. The Tasks of marking attendance and handled manually by pen and paper method. This method consumes more time and adds more workload to the subject Teachers and sometimes the data may prone to error. To [4] avoid these problems. This application is mainly designed for the faculties and other staff members of the Institute who maintain attendance and marks regularly.

More students participate in class and learn more when the attendance system is effective. The conventional approach has over time proven inefficient as students can easily write attendance for their absent friends, and the fact that records can be misplaced or destroyed easily . There is also the problem of impersonation amongst students, false identities being used in getting into the examination hall to partake in examinations . This has [5] terribly affected the credibility of examinations and the suitability of graduates being employed into job positions after school. All data used in the proposed attendance system were managed in the server using MySQL. The proposed attendance [6] system used two connection types, Wi-Fi connection, to connect the Android smartphone and the server, In addition, the menace called examination impersonation can be eliminated from the institutions to provide an atmosphere with free and fair examination. This in turn makes the award of degrees from institutions much more credible.

# Literature Review

Plenty of research has been conducted so far on the various available methods for implementation of an effective attendance monitoring system. These methods vary in terms of the types of input method used, the types of data processing employed and the controllers used to implement the systems. In this section looking for the various available solution with the advantages and disadvantages of each system.

1. Ghalib Al-muhaidhari-2019 [1], “Attendance System Using face technology with Embedded Camera on Mobile Device” .The two devices are basically inductor coils which can respond to an electromagnetic induction. The active device is utilized to produce an electromagnetic field of a given radius and strength. Which used to implement an attendance system.
2. Global Journals Inc. (USA)-2016 [2] “Development of Voice Recognition for Student Attendance” As an alternative solution, biometrics technologies can be introduced to construct a more powerful version of attendance system. Biometric is an authentications technique that recognizes unique features in each human being. In this case, voice recognition is used as biometric because it is a natural signal to produce. Each person has their unique characteristic in speech and voice that can be captured and analyse to make this new class attendance more efficient and effective. Voice recognition can be divided into two, which are speech recognition and speaker recognition. Both are using voice biometric differently. Speech recognition is the ability to recognize what have been said while speaker recognition is the ability to recognize who is speaking.
3. Rajan Datt, Utsav Shah,-2018 [3],”Student Attendance Management System using Fingerprint Scanner” in this paper they have developed Student Attendance Management System which is used to identify the students uniquely using their Fingerprints. For the development of this system we have used Raspberry Pi 3, Serial 16x2 Serial LCD and Fingerprint Scanner tools. By using this we have developed system which is storing information of the student, verifying detail and generate report for the future use. During the attendance verification student keep his finger against the scanner and system will find whether the record is existing in the database or not, display proper message.
4. Sifatnur Rahman-2018 [4] “Automated Student Attendance System using Fingerprint Recognition” In this system, attendance is marked after students biometric identification. For student identification, a fingerprint recognition based identification system is used. Fingerprint features are considered to be the best and fastest method for biometric identification. These features are more secure to use and unique for every person that don’t change in one’s lifetime. Fingerprint recognition is a mature field today, but still identifying individual from a set of enrolled fingerprints is a time taking process.
5. Dept. of Telecommunication Engineering, MUET, Jamshoro, PK –2018 [5]“Smart Attendance Management System Using Face Recognition” In this paper they have used As the time for corresponding subject arrives the system automatically starts taking snaps and then apply face detection and recognition technique to the given image and the recognize students are marked as present and their attendance update with corresponding time and subject id.they have used deep learning techniques to develop this system, histogram of oriented gradient method is used to detect faces in images and deep learning method is used to compute and compare feature facial of students to recognize them. Our system is capable to identify multiple faces in real time[15].
6. Folasade O. Isinkaye, Jumoke Soyemi-2020 [6] “An Android-based Face Recognition System for Class Attendance and Malpractice Control” In this paper they explain that a mobile system running on the Android Operating System was developed using the Viola-Jones object detection framework and Eigen faces to carry out Facial Recognition of students and take record of attendance in classes in a user-friendly and secure manner. The facial recognition ability of the system was tested with 95% accuracy while that of Facial Detection ability gave an accuracy of 78%. The optimum security performance achieved by the system was based on its strong backend and its distinct modular structure.
7. Khem Puthea, Rudy Hartanto and Risanuri Hidayat -2017 [7] “A Review Paper on Attendance Marking System based on Face Recognition” In this Paper they have explain that how they by using this technology mark the attendance. they are using the technique like use Face Recognition, Histogram Oriented Gradient, Automatic System, AMS.
8. Akinduyite C.O\*, Adetunmbi A.O, Olabode O.O, Ibidunmoye E.O -2013 [8]“Fingerprint-Based Attendance Management System” This paper presents the attendance management system using fingerprint technology in a university environment. It consists of two processes namely; enrolment and authentication. During enrolment, the fingerprint of the user is captured and its unique features extracted and stored in a database along with the users identity as a template for the subject. [13]The unique features called minutiae points were extracted using the Crossing Number (CN) method which extracts the ridge endings and bifurcations from the skeleton image by examining the local neighborhoods of each ridge pixel using a 3 x 3 window. [14]The fingerprint-based attendance management system was implemented with Microsoft’s C# on the. NET framework and Microsoft’s Structured Query Language (SQL) Server 2005 as the backend. The experimental result shows that the developed system is highly efficient in the verification of users fingerprint with an accuracy level of 97.4%.
9. Sidra Tasleem1, Pakiza Bano2, Hameedur Rahman3 -2020 [9] “Student Attendance Management System Based On Face Recognition” In this system will store student's face images into database and then mark automatically attendance of students after this save the result in database. The attendance will be stored according to date and time. There are five main point in this system :( 1) first of all student will login with username and password. (2) After this student will be able to mark automatic attendance thought face recognition (image already stored in database). (3) Lecture will be login (4) Lecturer can allow students for attendance, view attendance (5) Admin after login can register the students, store images of students into database and train the model.
10. Maddu Kamaraju1, Penta Anil Kumar2 -2014 [10] “Wireless Fingerprint Attendance Management System” in this paper provides the design method of wireless fingerprint attendance system based on Zigbee technology. The system includes terminal fingerprint acquisition module and attendance management module through computer. It can realize automatically such functions as information acquisition of fingerprint, processing, wireless transmission, fingerprint matching, and attendance management.
    1. **Existing System**

Table.1 Summary of Existing system

|  |  |  |
| --- | --- | --- |
| **Author & Year** | **Technology** | **Proposed System** |
| Sutar et al. (2022) | Android, and QR code | Propose a system by generating a QR code for each lecture and scanning it for marking [11]. |
| Chandramouli et al. (2021) | IoT, NVIDIA Jetson Nano, and Face Recognition | Faces are identified by the Haar classifier, then recognized by LBPH Algorithm, the histogram is checked against the dataset and marks attendance [13]. |
| Kumar and Kumar (2021) | Android, GPS, and Server | Students’ location is decided by GPS using phones this is defined as a key to marking attendance [12]. |
| Susanto et al. (2021) | Android, and Face Recognition | Developing an Android app through speed detection Recognition using OpenCV. The LBPH Histogram will be embedded in facial detection [8]. |
| Folasade O. Isinkaye, Jumoke Soyemi (2020) | Android, and Face Recognition | the Android Operating System was developed using the Viola-Jones object detection framework and Eigen faces |
| Rajan Datt, Utsav Shah,-2018 | Keywords-Finger print,Bio-matric,python,IoT (Internet of Things) | For the development of this system we have used Raspberry Pi 3, Serial 16x2 Serial LCD and Fingerprint Scanner tools |
| Sifatnur Rahman-2018 | Attendance System, Biometric Features, Fingerprint Recognition, Identification, Verification | Fingerprint features are considered to be the best and fastest method for biometric identification. These features are more secure to use and unique for every person that don’t change in one’s lifetime. |

# Methodology

Based on the literature survey as we have studied various topics thoroughly that are directly linked with our project we are going to design a possible solution to our problem. [1] In this age of technology and automation, we continue to use the same antiquated methods. In this section, we'll outline a technique that will provide a high-level view of how to approach our project and how it ought to be carried out. Because the prior work was insufficient, [3] we developed this project in the most practical and effective manner we could. The proposed face detection module for this project is Eigenface algorithm with android application Also, for face recognition modules which is proposed for this project is Eigen face with AIML and Android application with dB library in python.

* 1. **Proposed System**

The aim has been served rather effectively by the current attendance marking system, which involves the faculty manually calling out the roll call. [2] The old method of taking attendance may no longer be practical given the changes to the educational system brought about by the introduction of new technology in the classroom, such as the virtual classroom. Even [7] with the growing number of academic programmes offered by institutions, manually processing attendance may take some time. Therefore, the goal of our research is to develop a system for tracking attendance in schools utilising facial recognition technology and an effective database.

* 1. **Scope of this system**

We are getting ready to design a two-module system. The first module (face detector) is a mobile component that functions essentially as a camera application that takes pictures [6] of students' faces and stores them in a file utilising face extraction and computer vision face detection methods. The second module is a face recognition programme [9] that registers the students, does face recognition on the photos (faces) in the file, and then saves the results in a database for later study.

* 1. **Objectives of this System**

The major goal of this project is to provide a system that makes it easier and more automated to track and record student attendance using facial recognition software. [10] To identify or confirm a person from a digital image through mobile application and stores the data in database in real time based application.’

* 1. **Proposed System Flowchart**

Face Detection

Face Recognition

if there is face match

Get student ID

Not match ID

mark student as Present in database

mark student as absent in database

Database

Fig.1.1 Flowchart of face recognition technique

* 1. **Features**

1. Face recognition based Solution
2. Contactless Attendance Solution based on Mobile
3. Real-time Attendance
4. Attendance reports with face photo, with Branch-ID , PRN No.
5. Teacher can take attendance using their own mobile.
6. Low Capex, completely app-based offering
   1. **Technique Used**
7. AIML-FACE RECOGNITION - Using machines language to make cognitive decisions. From recognizing faces through camera on mobile and identify the person.
8. ANDROID-UI - The role of the Android - UI is to display the application data on the screen and also to serve as the primary point of user interaction and help to run application smoothly.
9. DBMS - It will store the data of student on real time face recognition through phone and mark the attendance of student.
   1. **Conclusion**

We chose the project with the demands of the society's daily requirements and wishes in mind: an automated attendance tracking system. [9] The development of technology encourages us to think creatively and generate ideas that may change the world. The most essential possession that every individual should have is education, as it serves as the foundation for a better way of life and will undoubtedly raise the level of living in a community. [8] The participation of students in the schools, colleges, and universities is what our educational system lacks. [6] They choose to skip class and stay busy utilising these devices rather than attending lectures and doing their homework. Low enrolment indicates that the students are not present. This system can not only merely help in the attendance system, but also improve the goodwill of an institution.[7]

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