# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

## IN COMPUTER & COMMUNICATION ENGINEERING

**INTERNATIONAL STANDARD SERIAL NUMBER INDIA**

**Impact Factor: 8.379**

# Smart Attendance Capturing Mobile App

**ChaitaliBhosale[1], Gayatri Pawar[2], Aakanksha Bhavsar[3], Vaishnavi Suryawanshi[4]**

UG Student, Department of Computer Engineering, SSBT's College of Engineering and Technology, Jalgaon, India[1]

UG Student, Department of Computer Engineering, SSBT's College of Engineering and Technology, Jalgaon, India [2]

UG Student, Department of Computer Engineering, SSBT's College of Engineering and Technology, Jalgaon, India [3]

UG Student, Department of Computer Engineering, SSBT's College of Engineering and Technology, Jalgaon, India [4]

**ABSTRACT:** Face is the crucial part of the human body that uniquely identifies a person. Using the face characteristics as biometric, the face recognition system can be implemented. The most demanding task in any organization is attendance marking. In traditional attendance system, the students are called out by the teachers and their presence or absence is marked accordingly. However, these traditional techniques are time consuming and tedious. In this project, the Open CV based face recognition approach has been proposed. This model integrates a camera that captures an input image, an algorithm for detecting face from an input image, encoding and identifying the face, marking the attendance. This project intends to serve as an efficient substitute for traditional manual attendance systems. It can be used in corporate offices, schools, and organizations where security is essential.

**KEYWORDS**: Face Recognition, Attendance,OpenCV

## I. INTRODUCTION

Student attendance system is the system of taking the attendance of the student on basis of presence in class. Successful industries, schools, universities begin by engaging students and making sure that they will come regularly so the attendance rate become very important. The attendance is important because students are more likely to succeed in academics when they attend class consistently. It's difficult for the lecturer to build students' skills and progress if a large number of students are frequently absent. Because of the advancement of technology today has immersed itself towards education. The presence of technology has reached its maximum of providing sustainable technology towards quality education through delivery and effective learning and smart devices have become a way of life especially in higher education academic fields be able to develop their system into smart attendance

## II. RELATED WORK

[1] Attendance System Using NFC Technology with Embedded Camera on Mobile Device : According to research journal "Attendance System Using NFC (Near Field Communication) Technology with Embedded Camera on Mobile Device" (Bhise, Khichi, Korde,Lokare, 2015). The attendance system is improved by using NFC technology and mobile application. This system couldn't automatically spot the violation when the NFC tag is not personally tagged by the original owner. Apart from that, the convenience of the system which uses the mobile phone as the NFC reader was actually an inconvenience to the lecturer.

[2] Face Recognition Based Attendance Marking System : The second research journals "Face Recognition Based Attendance Marking System" (SenthamilSelvi, Chitrakala, Antony Jenitha, 2014) is based on the identification of face recognition to solve the previous attendance systems issues. This system requires a standalone computer which will need a constant power supply that makes it not portable.

[3] RFID based Student Attendance System : According to the fourth research journal "RFID based Student Attendance System"(Hussain, Dugar, Deka, Hannan, 2014),the proposed solution where RFID technology is used to improve the older attendance system. This system is imperfect in the sense that, firstly, it is not portable, as the RFID reader can only work when it is connected to a PC

## III. METHODOLOGY

The development of the attendance management system involved the following steps:

A. Data Collection: A dataset of students photos was collected to train a facial recognition model. This dataset was collected with the consent of the employees and in compliance with applicable data protection laws.

B.  Facial Recognition Model Training: A facial recognition model was trained using the collected dataset. The model was trained using Convolutional Neural Networks (CNNs) to recognize student's faces.
C.  System Implementation: The system was implemented using OpenCV and DLib libraries for face recognition. A camera capture student photos, and the facial recognition model was used to compare the student's photo to the stored dataset. The attendance record was updated in real-time based on the facial recognition results.
D.  Geofencing Integration: Geofencing was integrated into the system using GPS coordinates or beacon technology. This was done to ensure that students can only clock in or out when they are within a certain distance from the institute.
E.  Mobile Application Development: A mobile application was developed using Flutter to display student attendance records and set up geofencing parameters. The face recognition and geofencing features were integrated into the mobile application.
F.  Testing: The system was tested extensively to ensure its accuracy, efficiency, and compliance with applicable laws and regulations. The system was refined based on the testing results.

## IV. PROPOSED ARCHITECTURE

The architecture for the proposed system has been designed to keep it pretty straightforward and easy to understandas shown in Fig.1. The steps that have to be undertaken to reach the final end step of the system which is making sure the attendance of the student is updated correctly and timely. The system can easily be accessed by anyone, where attendance of the students can easily be checked and maintained by the faculty as when required.
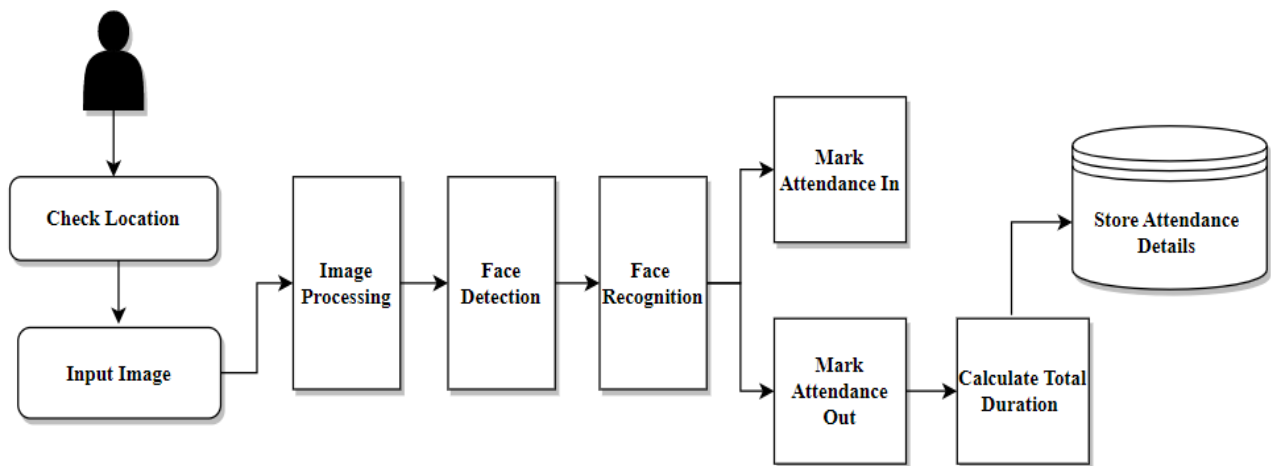


Fig.1 System Architecture

The concepts behind backend development, Docker, frontend development, and how they are integrated with Google Cloud Platform (GCP) for the attendance management system project are as follows:-

Backend Development: In the case of the attendance management system, it involves designing and building a system to manage student attendance records. This includes designing the data model for storing student attendance records, building an API to expose the necessary functionality to the frontend, and building the necessary business logic to implement the required functionality.

Django : It is a popular Python-based backend framework used for web application development. Django provides a rich set of features for building web applications, including a powerful ORM (Object-Relational Mapping) system for database management, an extensive list of built-in libraries for authentication, security, and other web development tasks, and a flexible URL routing system for handling HTTP requests.

Docker: Docker is a containerization platform used for packaging applications and their dependencies into containers that can be easily deployed and run on any platform. Docker provides a standardized way of packaging and distributing applications, making it easier to manage and deploy them across different environments. Using Docker for the attendance management system project enables you to package the Django backend and its dependencies into a container, making it easier to manage and deploy. It also provides a consistent and reliable environment for running the backend, ensuring that it runs the same way across different environments.

Frontend Development: In the case of the attendance management system, it involves building a mobile application using the Flutter framework. Flutter is a popular framework for building mobile applications that run on both Android and iOS platforms. Flutter provides a rich set of widgets and tools for building beautiful and responsive user interfaces. It also has support for platform-specific features, such as geofencing in the case of the attendance management system project.

Integration with Google Cloud Platform (GCP): In the attendance management system project, GCP can be used for deploying the Docker container containing the Django backend. The container can be deployed on a managed platform, such as Kubernetes or Cloud Run, which provides automatic scaling, high availability, and easy management. The Flutter mobile application can also be integrated with GCP services, such as Cloud Firestore, which is a NoSQL document database that can be used for storing and managing data from the mobile application.

In summary, the attendance management system project involves developing the backend using Django and Docker, building the frontend using Flutter, and deploying the backend and frontend on GCP for scalability and management.

## V.  RESULT AND DISCUSSION

The attendance management system using face recognition and geofencing proved to be an accurate and efficient method of attendance management. The system was able to recognize students faces with a high degree of accuracy, and the geofencing feature ensured that students could only clock in or out when they were within the specified distance from the workplace. The mobile application developed using Flutter provided an easy-to-use interface for employees to check their attendance records and set up geofencing parameters. The system was tested extensively and was found to be compliant with applicable data protection laws and regulations.

## VI. CONCLUSION AND FUTURE WORK

This project has resulted in development of a cross-platform mobile application which helps instructors and students to quickly record attendance. Proposed system is designed to reduced the human effort for taking the attendance manually which take place in every organization.

The future of attendance tracking lies in the development of more advanced and integrated solutions. Artificial intelligence and machine learning technologies can be used to predict employee attendance and identify patterns of absenteeism. Virtual reality and augmented reality technologies can also be used to track employee attendance and performance in remote work environments.

## REFERENCES

1. Mark Andrejevic Neil Selwyn (2020) "Facial recognition technology in schools: critical questions and concerns, Learning, Media and Technology,https://www.tandfonline.com/doi/full/10.1080/17439884.2020.1686014
2. Li Wang, Ali Akbar Siddique. "Facial recognition system using LBPH face recognizer for anti-theft and surveillance application based on drone technology" , Measurement and Control, 2020 https://journals.sagepub.com/doi/10.1177/0020294020932344
3. John D. Woodward, Jr., Christopher Horn, Julius Gatune, and Aryn Thomas "Biometrics: A look at facial Recognition", 2003  https://apps.dtic.mil/sti/pdfs/ ADA414520.pdf
4. Samuel Lukas, Aditya Rama Mitra, RirinikanaDesanti, Dion Krisnadi, (2016). "Student attendance system in classroom using face recognition technique" 2016 International Conference on Information and Communication Technology Convergence (ICTC). doi:10.1109/ictc.2016.7763360 https://ieeexplore.ieee.org/document/7763360

INNO SPACE
SJIF Scientific Journal Impact Factor

**Impact Factor:** 8.379

doi crossref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

## IN COMPUTER & COMMUNICATION ENGINEERING

📱 9940 572 462  🟢 6381 907 438  ✉ ijircce@gmail.com

Scan to save the contact details