Department of Information Technology

A.P. Shah Institute of Technology

G.B.Road,Kasarvadavli, Thane(W), Mumbai-400615

UNIVERSITY OF MUMBAI

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A Project Report on

AI Based Smart Attendance System

Submitted in partial fulfillment of the degree of
Bachelor of Engineering(Sem-8)
in
INFORMATION TECHNOLOGY

By
Jayesh Bhosale (17104014)
Tejas Bhanushali (17104031)
Yash Gangani (18204009)

Under the Guidance of
Prof. Anagha Aher
Prof. Neha Deshmukh

1.Project Conception and Initiation

1.1 Abstract
1.2 Objectives
1.3 Literature Review
1.4 Problem Definition
1.5 Scope
1.6 Technology Stack
1.7 Benefits for environment & Society

1.1 Abstract

One necessary component of every education system is recording students attendance. The managing attendance manually can be a time-consuming task for the teacher. To resolve this problem, a smart attendance management system is being used.

The smart attendance system generally requires a biometrics method for execution. Face recognition is one of the best biometric methods to improve this system. By utilizing this smart system, the problem of proxies can easily be solve.

This project proposes a model for implementing a smart attendance management system for students of a class by making use of face recognition technique and sending alerts to parents about the student’s presence with the help of a message alert system. The parents will also be able to visualize their wards overall attendance with the help of a dashboard.

1.2 Objectives

- To develop a smart attendance management system using facial recognition that will take care of the problems which are being faced in manual attendance systems.
- To develop a message alert system to notify parents about ward's attendance.
- To make a dashboard to review and visualize attendance of a student.
- To make it useful not only to wards but also to faculties for scheduling or rescheduling the lectures.

1.3 Literature Review

Sr No.	Authors	Year	Methodology	Advantage	Disadvantage
1.	Smita Tripathi Varsha Sharma Sanjeev Sharma	2011	A new face detection method which combines the Skin Color Detector and the Template Matching Method. Template matching methods find the similarity between the input images and the template images (training images).	This method had a 98% face detection probability.	This method can't use one or more color spaces in the skin color detector.
2.	K. Simonyan Andrew Zisserman	2014	Visual Graphic Group(VCC) model for face recognition including. Illumination pre-processing algorithm.	This system can achieve 100% accuracy under good illumination. Environment of poor illumination the accuracy is 85.9% but accuracy is reach more than 90% through pre-processing.	Attitude and expression individual changes a lot when take photos which will have certain effect on face recognition results and illumination is too poor. The accuracy of this system is not constant.

1.3 Literature Review

Sr No.	Authors	Year	Methodology	Advantage	Disadvantage
3.	Florian Schroff Dmitry Kalenichenko James Philbin	2015	Author suggested method based on learning a Euclidean embedding per image using a deep convolutional network. The network is trained such that the squared L2 distances in the embedding space directly correspond.	Much greater representational efficiency.	Indirectness and its inefficiency.
4.	K. Goyal K. Agarwal Rishi Kumar	2017	Face localization can be referred to as extraction of facial features using pattern recognition system. Both MATLAB and Open CV can be used for creating such prototypes and systems.	Haar cascades works and gives better accuracy in facial expression.	Initially, it was time consuming.
5.	Madhuram B. Prithvi Kumar Lakshman Sridhar Nishanth Prem	2018	Author suggested Eigenfaces using grayscale images. this paper shows us that it is easy to covert color images to grayscale and then to apply Histogram Equalization.	Classification is fast, even when it's applied at serveral scales.	Assumes a fixed scale for the face.

1.4 Problem Definition

- To record the attendance can be a great burden on the faculties if it is done by manually, and sending report of each student's attendance to respective parents also becomes tedious.

- To schedule the lectures for faculties at given time slot becomes easy.

- To provide visualization of ward’s attendance can be easily done by parents.

- By utilizing this framework, the problem of proxies and students being marked present even though they are not physically present can easily be solved.

1.5 Scope

- To record attendance manually it can be a tedious task, So we provide dashboard. Using that dashboard admin can register to students, faculties and parents. Also they can schedule the lecture and view the attendance.

- Faculty have permission to schedule the lecture, generate the defaulter list and send the notification to the parent. If the student attendance marked as an absent but student are present in the lecture then faculty can easily modify the attendance using edit attendance tab.

- Students and Parents can visualize the attendance using dashboard.

1.6 Technology stack

- Python3 (libraries required OpenCV).
- HTML, CSS.
- MySQL.
- Tableau.
- Flask web framework.

1.7 Benefits for environment & Society

- Our system is environment friendly since, it will help to reduce the manual paper attendance hence it saving cost and paper.
- Our system will help teachers to manage the attendance efficiently.
- Using our system student can visualize their attendance.
- Parents can also visualize their ward’s attendance.

2. Project Design

2.1 Proposed System
2.2 Design(Flow of Modules)
2.3 Description of Use Case
2.4 Activity Diagram
2.5 Class Diagram
2.6 Module

2.1 Proposed System

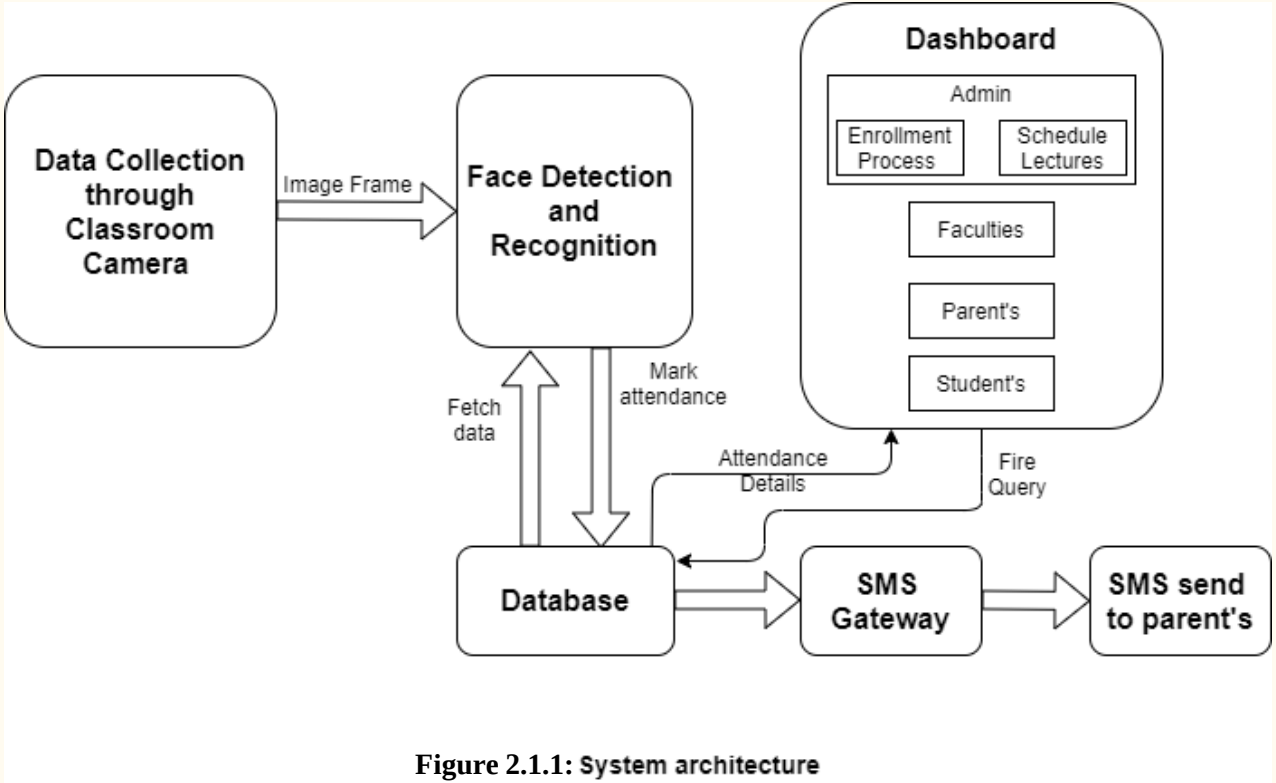


Figure 2.1.1: System architecture

2.2 Design(Flow Of Modules)

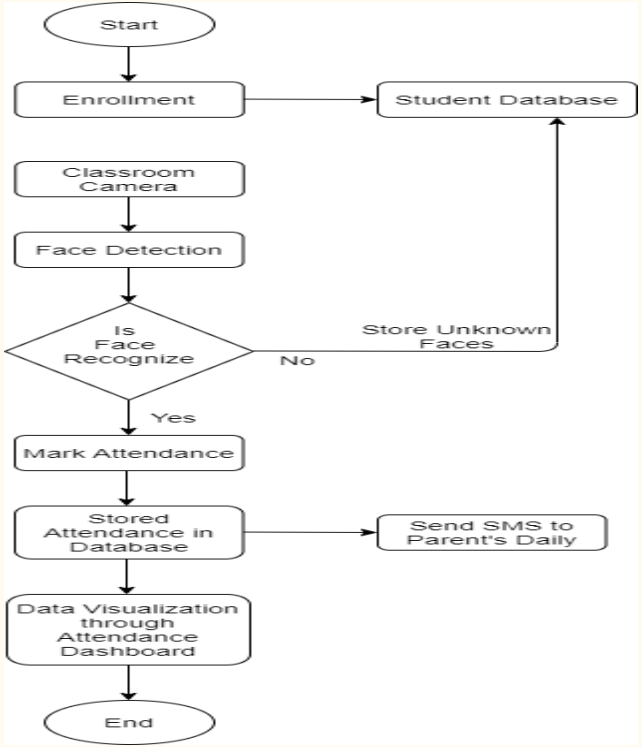


Figure 2.2.1: Flow of Modules

2.3 Description Of Use Case

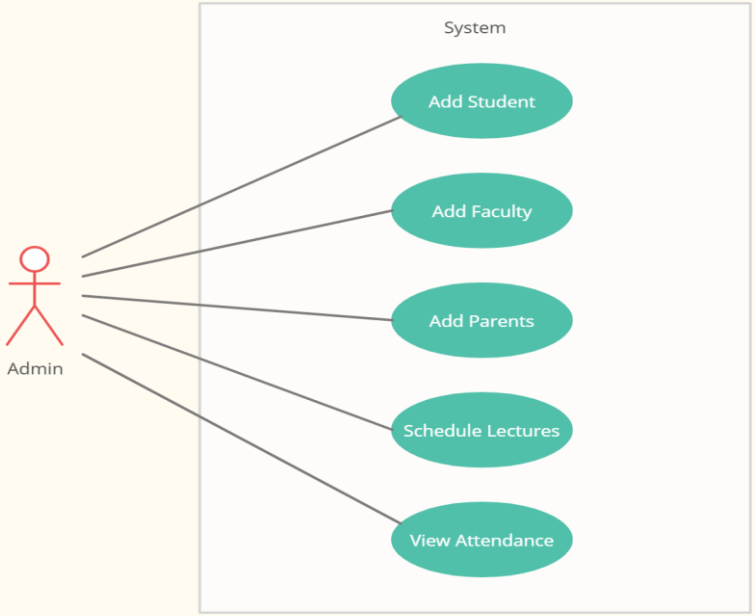


Figure 2.3.1: Use Case for Admin

In the above diagram Admin is an actor. Admin can register to students, faculties and parents. Also admin can schedule lectures and view the attendance.

2.3 Description Of Use Case

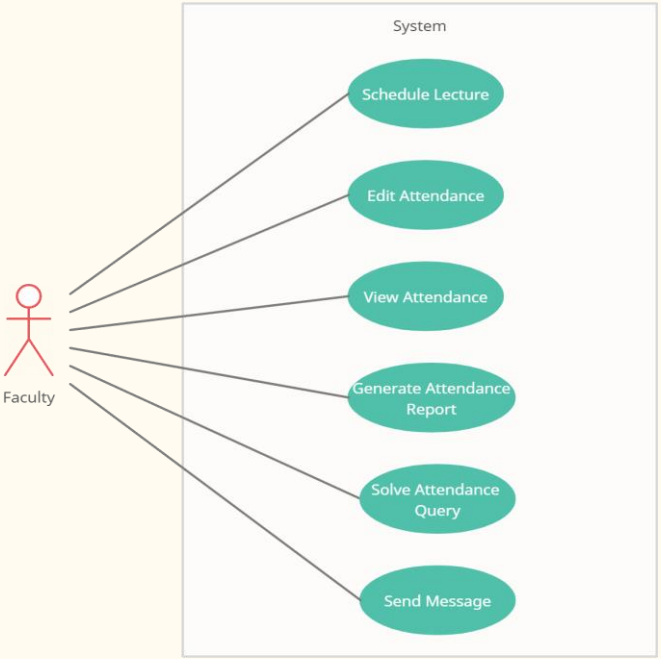


Figure 2.3.2: Use Case for Faculty

In the above diagram Faculty is an actor. Faculty can schedule lectures, edit attendance, view the attendance, generate attendance report and solve attendance query. Faculty can also be able to send attendance related notification to the parents through SMS.

2.3 Description Of Use Case

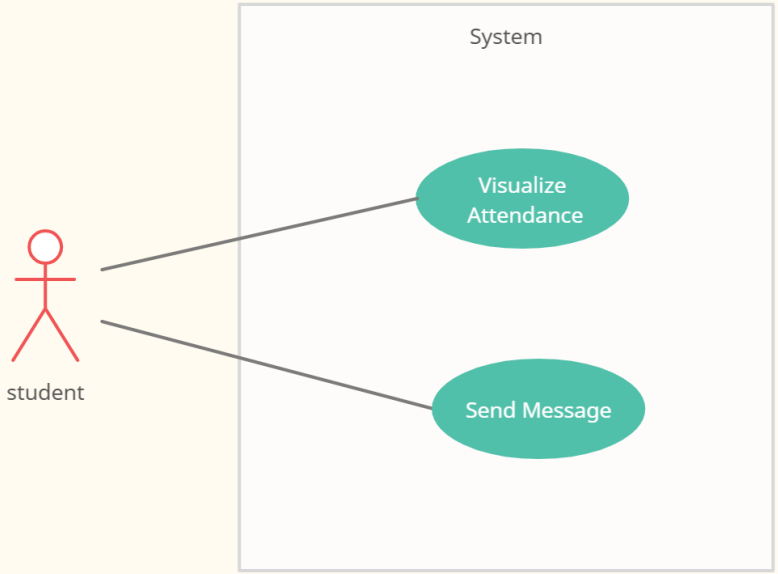


Figure 2.3.3: Use Case for Student

Here in the above diagram Student is an actor. Student can visualize their attendance and send message if they have any query related to the attendance.

2.3 Description Of Use Case

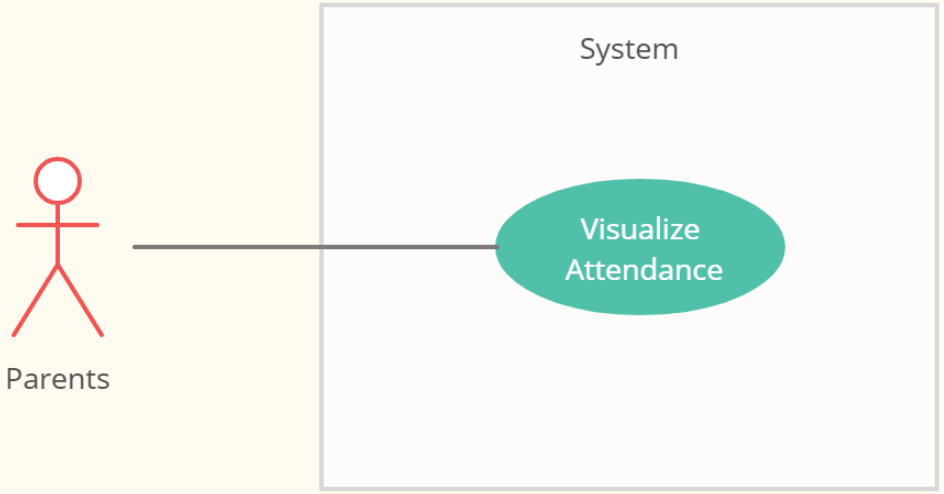


Figure 2.3.4: Use Case for Parents

In the above figure Parents is an actor. Parent can visualize their ward’s attendance using dashboard.

2.4 Activity Diagram

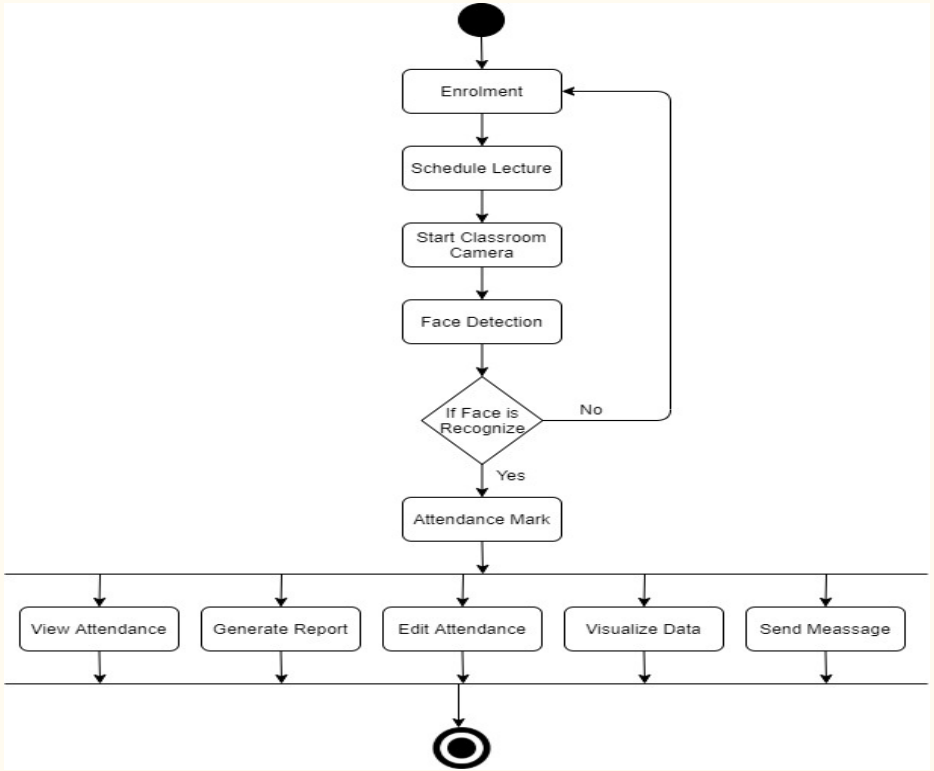


Figure 2.4.1: Activity Diagram

2.5 Class Diagram

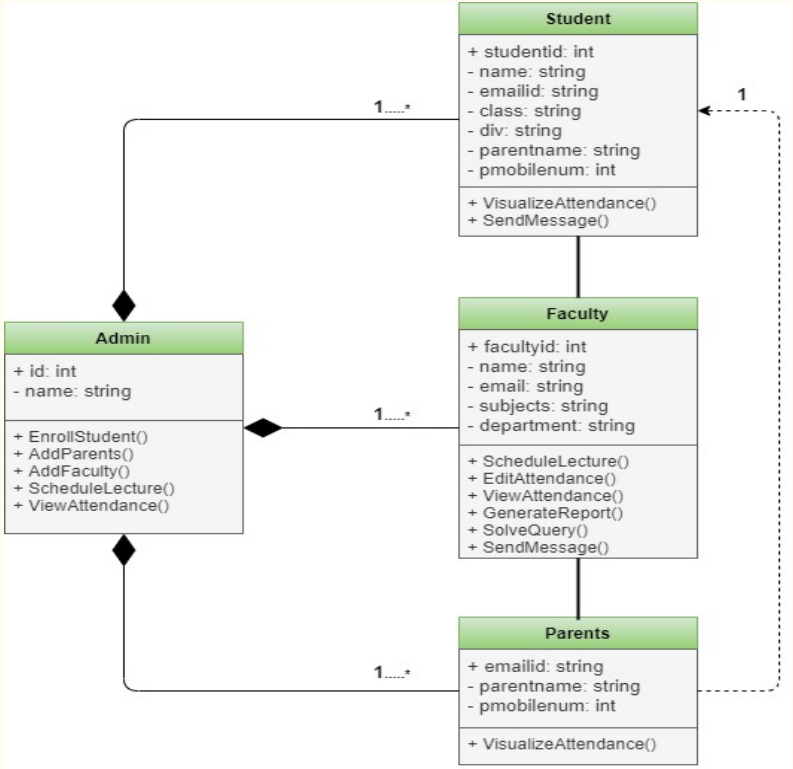


Figure 2.5.1: Class Diagram

2.6 Module-1: Enrolment

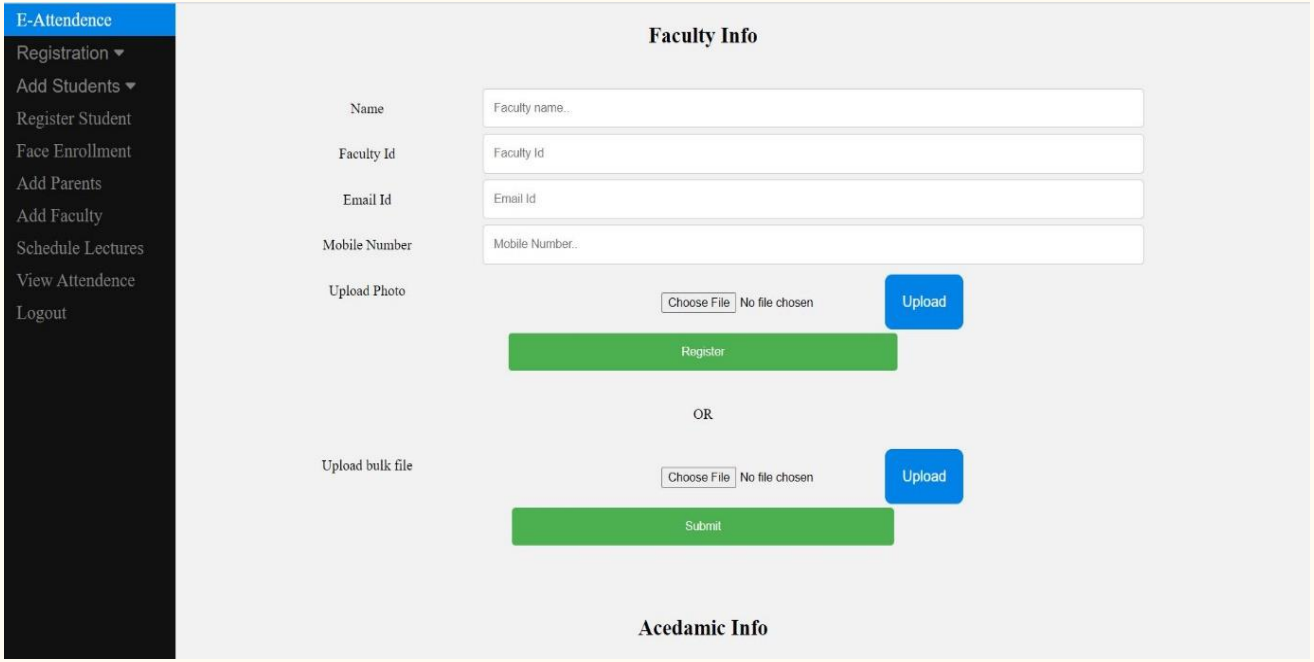


Figure 2.6.1: Faculty Enrolment

Module-1: Enrolment

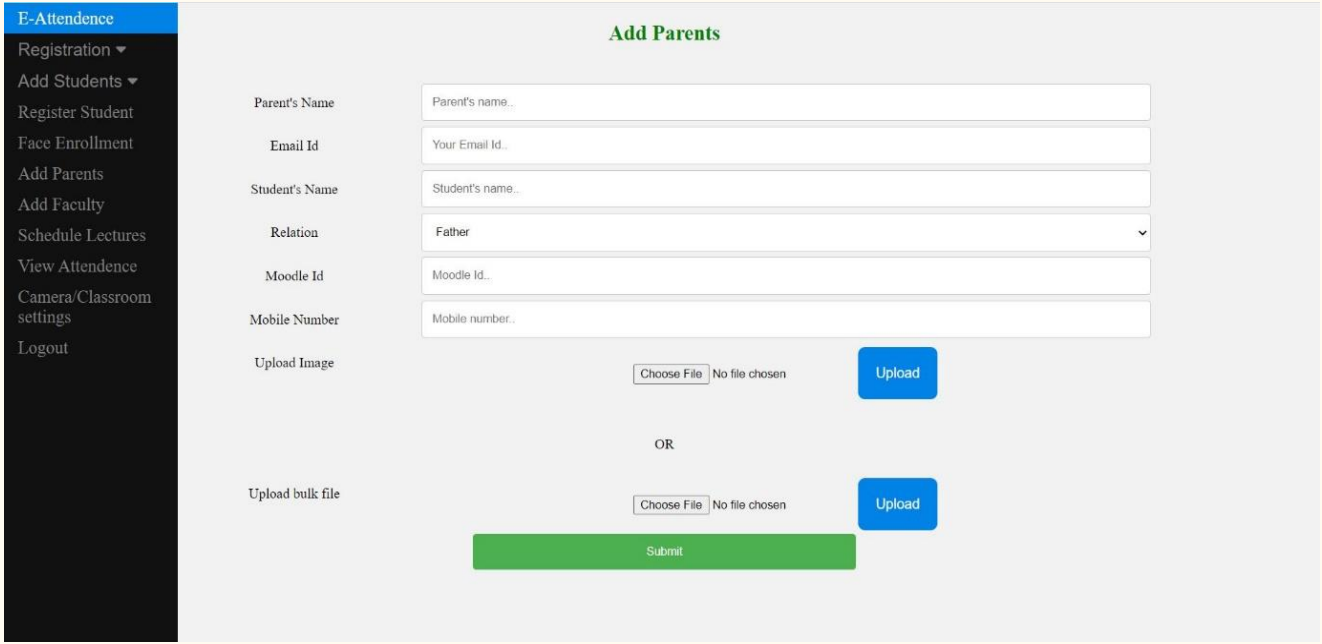


Figure 2.6.2: Parents Enrolment

Module-1: Enrolment

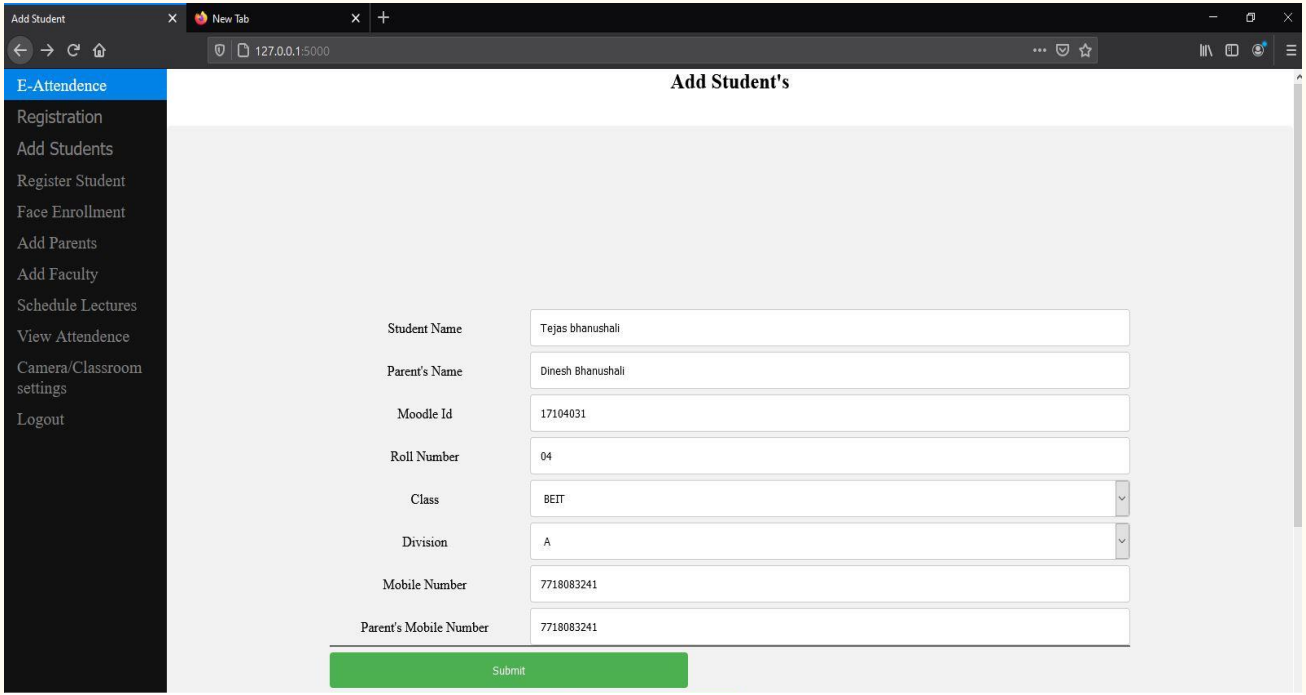


Figure 2.6.3: Student Enrolment

Module-1: Enrolment

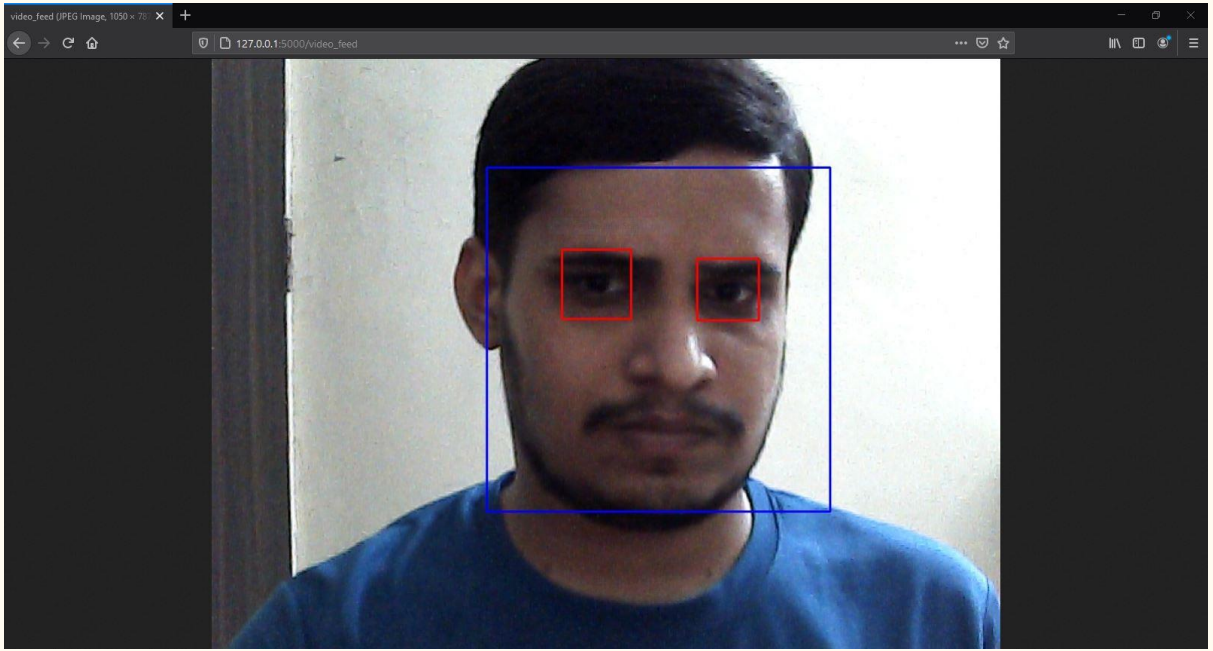


Figure 2.6.4: Student Face Enrolment

Module-2: Face Detection and Recognition

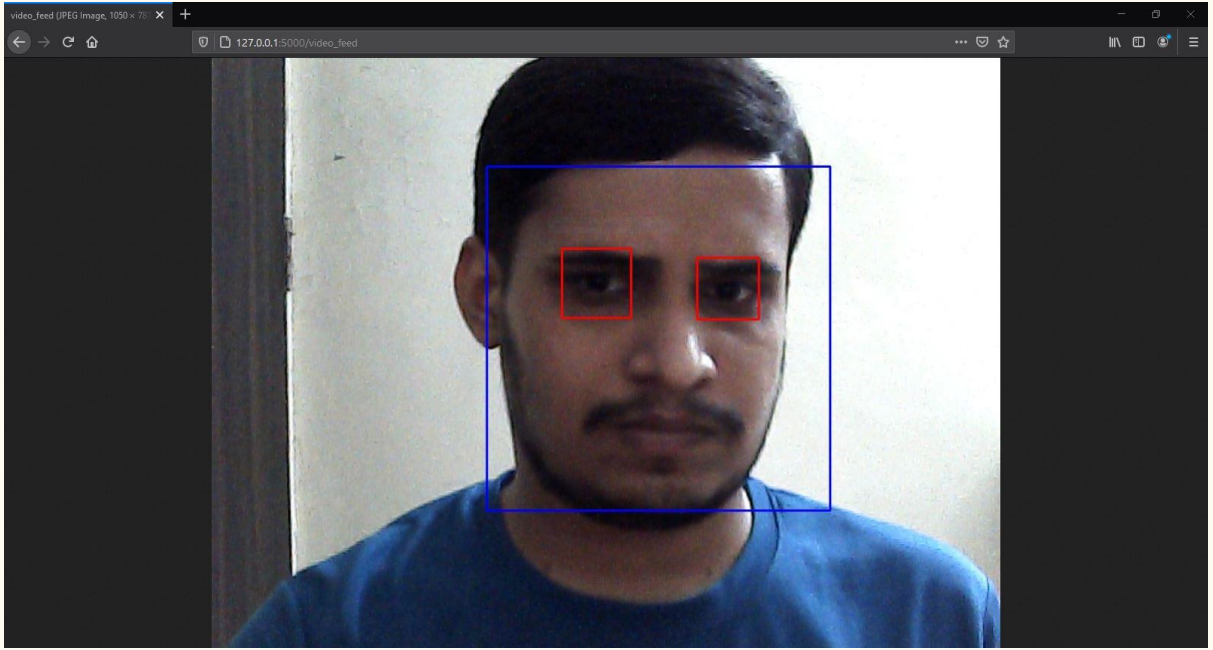


Figure 2.6.5: Face Detection

Module-2: Face Detection and Recognition

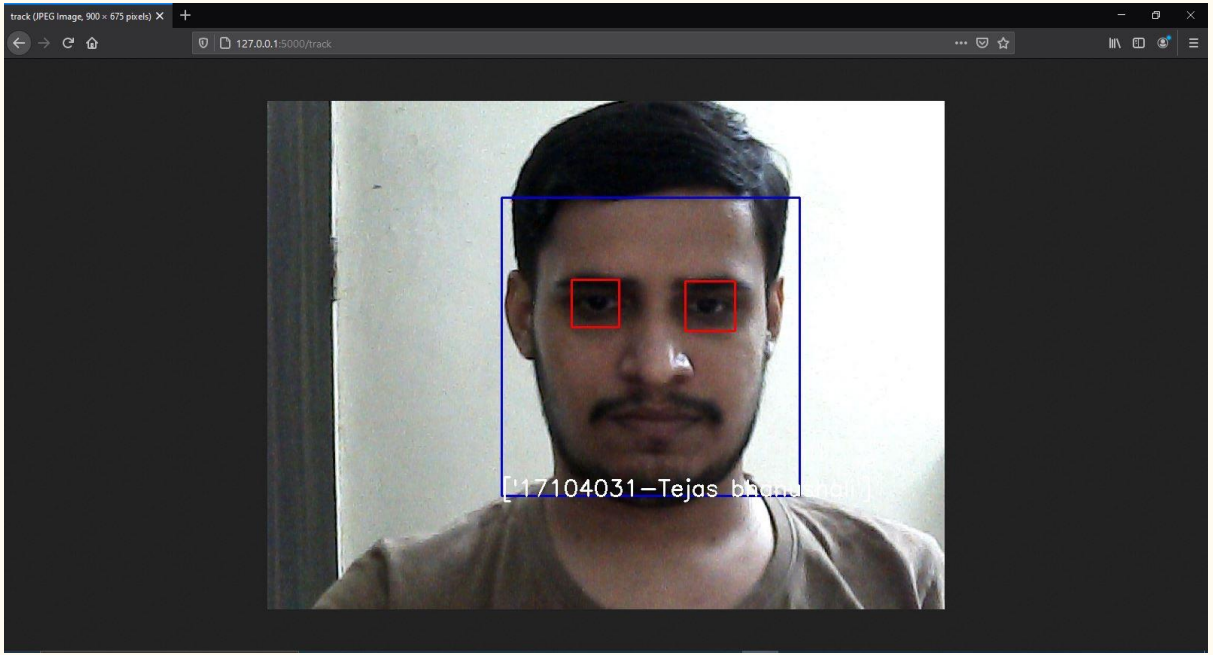


Figure 2.6.6: Face Recognition

Module-3: Dashboard

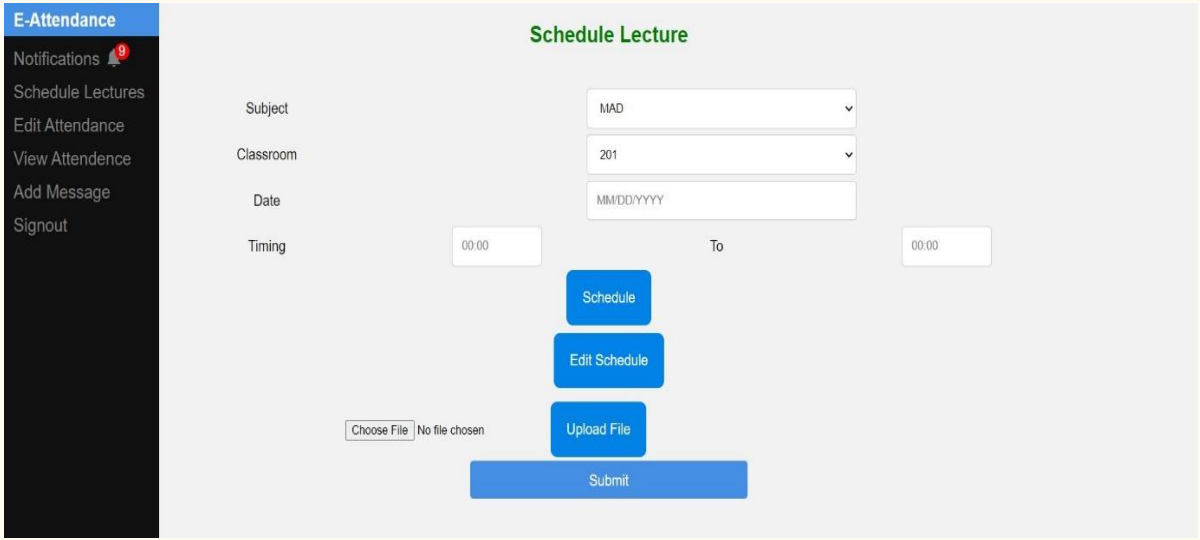


Figure 2.6.7: Schedule Lecture

Module-3: Dashboard

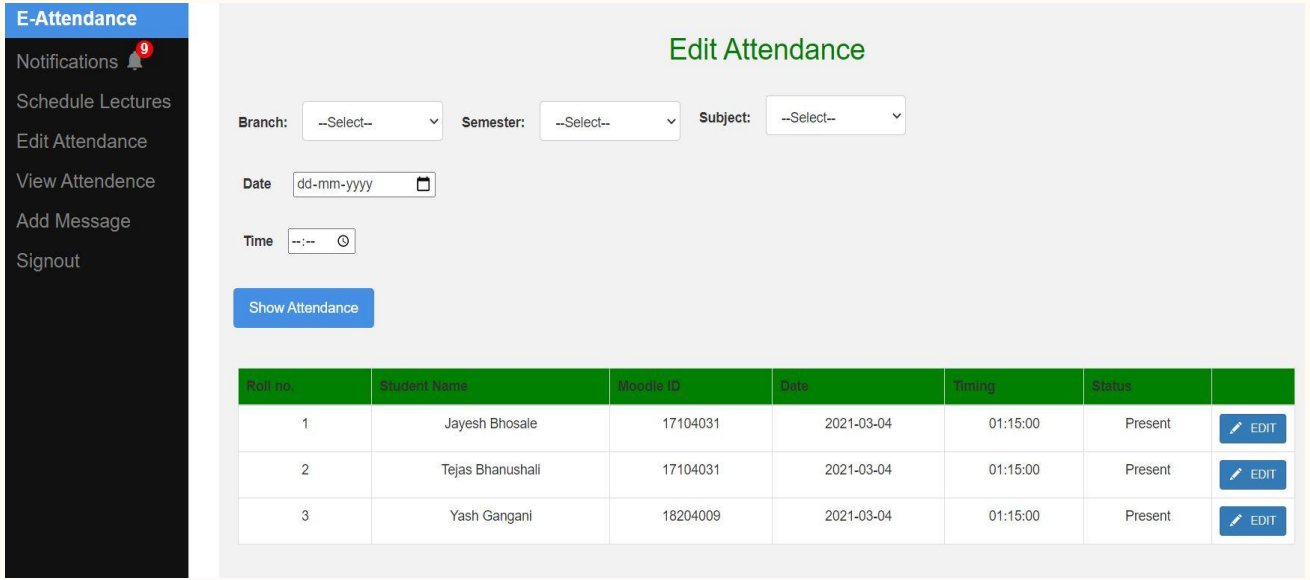
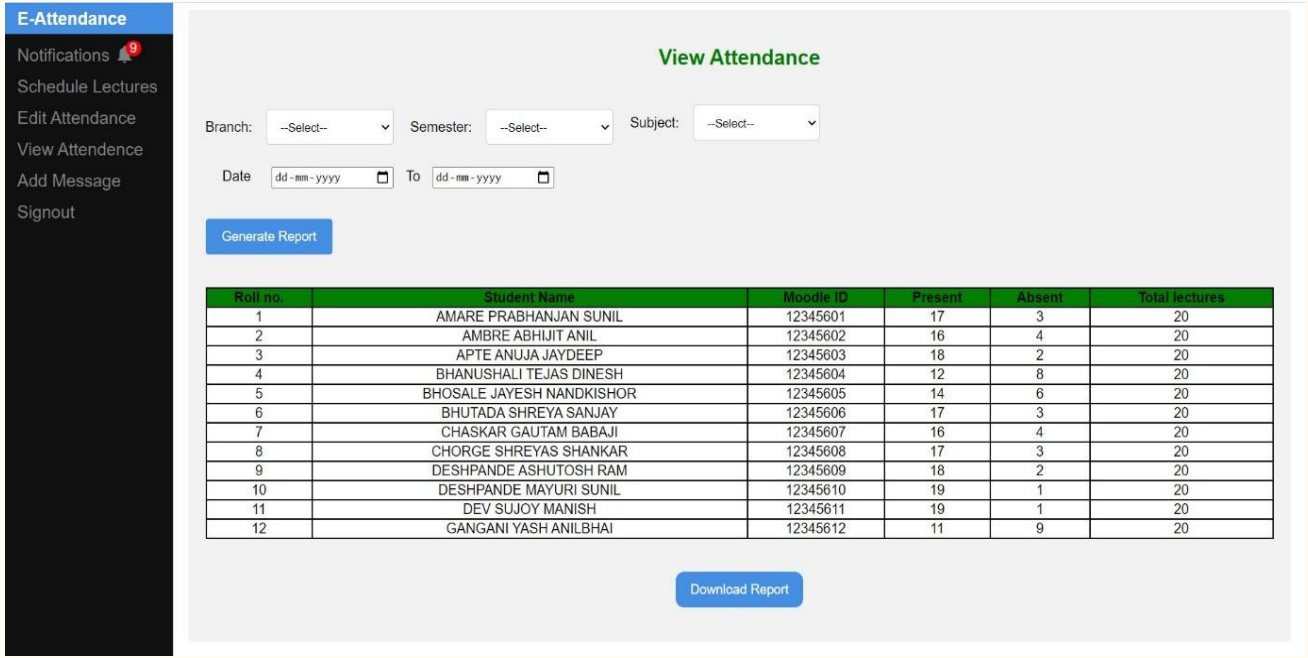


Figure 2.6.8: Edit Attendance

Module-3: Dashboard



Roll no.	Student Name	Moodle ID	Present	Absent	Total lectures
1	AMARE PRABHANJAN SUNIL	12345601	17	3	20
2	AMBRE ABHIJIT ANIL	12345602	16	4	20
3	APTE ANUJA JAYDEEP	12345603	18	2	20
4	BHANUSHALI TEJAS DINESH	12345604	12	8	20
5	BHOSALE JAYESH NANDKISHOR	12345605	14	6	20
6	BHUTADA SHREYA SANJAY	12345606	17	3	20
7	CHASKAR GAUTAM BABAJI	12345607	16	4	20
8	CHORGE SHREYAS SHANKAR	12345608	17	3	20
9	DESHPANDE ASHUTOSH RAM	12345609	18	2	20
10	DESHPANDE MAYURI SUNIL	12345610	19	1	20
11	DEV SUJOY MANISH	12345611	19	1	20
12	GANGANI YASH ANILBHAI	12345612	11	9	20

Figure 2.6.9: View Attendance

Module-4: Data Visualization Through Dashboard

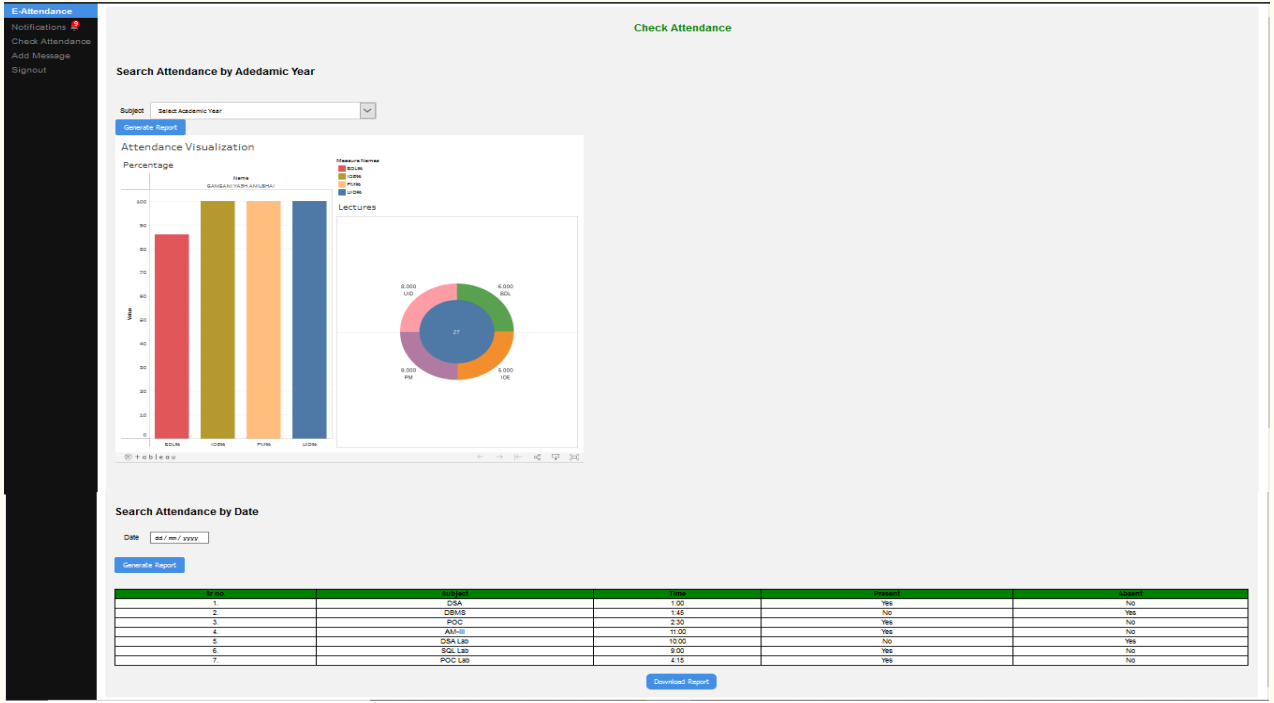


Figure 2.6.10: Visualize Attendance Data

Module-5: SMS alert System

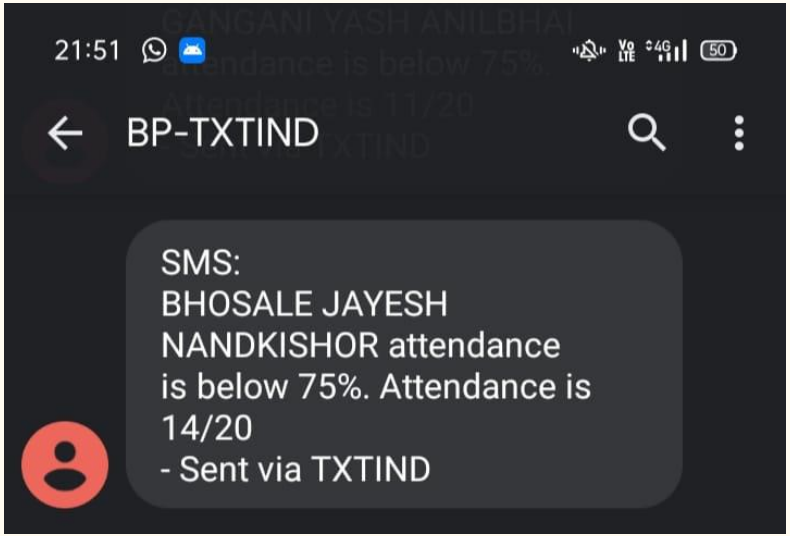


Figure 2.6.11: SMS Send To Parents

3. Conclusion and Future Scope

3. Conclusion and Future Scope

We have implemented an AI based smart attendance system. Which is used for taking attendance by tracking the student's face and comparing the face data using data set of pretrained data of student's face. We used Haar Cascade algorithm for face detection and face recognition. Our system is helpful for parents and students to see and visualize the attendance through dashboard. Our system is also helpful for faculty to schedule lecture and send notification to the parents related to their ward's attendance.

In the future, by making small updates to the system it might be able to track student's emotions through which the attention of students can be monitored, also during the examination it would be helpful to determine the ethics of students using emotion trackers in the system.

4. References

4. References

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Thank You