Department of Computer Science & Engineering
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Real-Time Video-Based Attendance System

(Course Code: CS 400)

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Abstract

Real-Time Video-Based Attendance System is Software for taking attendance by recognizing the faces of the students. When students come in front of the camera or from recorded video it takes attendance of the student and stores the details of the student in the MySQL database using the flask framework of python.

The System stores the student details on attendance like Teacher's Email, Date, Batch, Semester, Subject, Name, Roll Number, Time of attendance, etc.

A Teacher is required to log in before taking the attendance of students and put some details of attendance like Which batch, Semester, and Subject he wants to take the attendance of the students.

After taking the attendance Teacher can see all the student's attendance for the current class and also be able to view all old attendance. He/She can Filter the attendance by batch, semester, subject, date etc and there is a option of searching and pagination.

Contents

Chapter 1

Introduction

outline of the report

This report is organised in four main parts.

Chapter 1:- Introduction
Chapter 2:- Existing System Study
Chapter 3:- System Design
Chapter 4:- Implementation
Chapter 5:- Result analysis and Conclusion

1.1 Problem statement

Real-Time Video-Based Attendance System Software for taking the attendance of the students by recognizing the student's details in the video.

1.2 Motivation behind the selection of the project

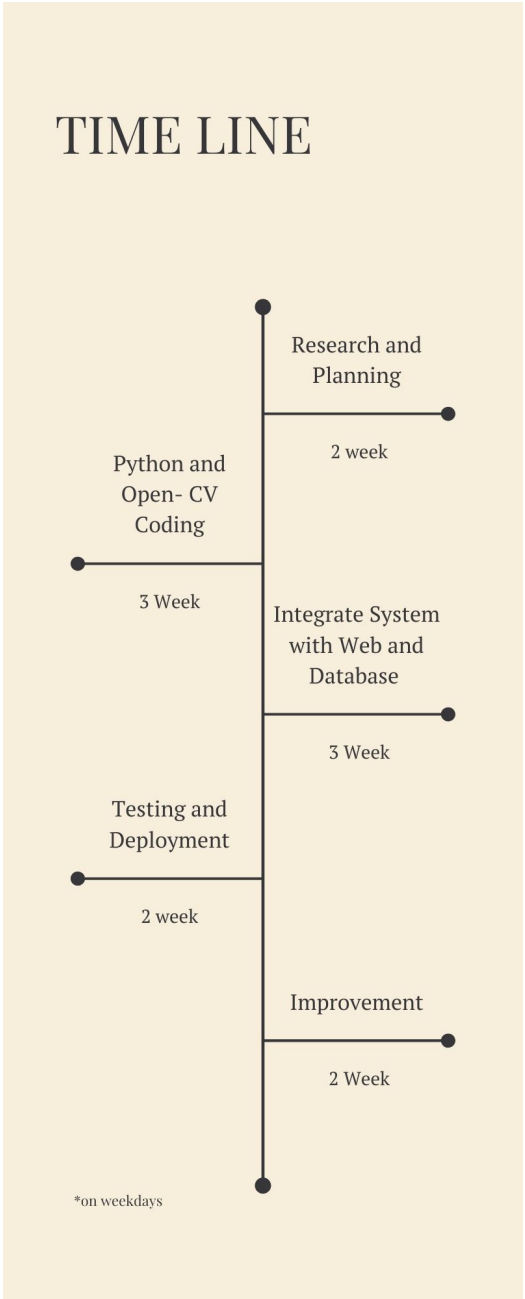
The motivation behind the project is that when a class start then at least 15 min is wasted for taking the attendance of the students and when student come to class after taking the attendance then again there is time taken for giving the attendance of that student.

But in the Real-Time Video-Based Attendance System, it takes automatically attendance of the students when they enter the class from camera or from recorded video and put the details of students like what time a student is entering, which batch, semester, etc and the teacher can analyze the attendance details after the class.

1.3 System/Software used

- **Open CV:** for recognize the face, human body etc.
- **Python Language:** for writing the code of openCV and webcam access
- **Flask Framework:** for integrate the software with the website
- **MySQL Database:** for store all the attendence and user details into database
- **HTML, CSS, JS, Bootstrap:** for website UI/UX

1.4 implementation plan



Chapter 2

Existing System Study

2.1 Existing system study

Some of the attendance systems are already available in the market but all the existing systems have some problems that the Real-Time Video-Based Attendance System can able to solve.

[1]. Fingerprint attendance system(ESSL-IDENTIX K30 PRO):-
In the fingerprint biometric system only one student can mark the attendence at a time that is take similar time to On paper attendence.

[2]. Id card chip attendance system(7602 Savior):-
In the Id card chip attendance system only one student can mark the attendence at a time that is take similar time to On paper attendence.

[3]. Face Recognition for Attendance System(ESSL-uFace302):-
There are a few face attendance systems that are also available but they also can recognize one face at a time and there is also available the multiple faces recognize attendance system but their setup is very complex.

In Real-Time Video-Based Attendance System, multiple students can mark the attendance at the same time, and set up for this system is very easy because it is a web based attendance system so just need to register the teacher and students by the academic section and start to operate the system for regular attendance.

2.2 Summary

So The Real-Time Video-Based Attendance System is used to mark the attendance for multiple students at the same time and store in the database so teachers can easily analyze the attendance of their class students.

It is very easy to set up the system because it is web-based software so just need to register students and teachers to start operating the system to take attendance.

Chapter 3

System Design

3.1 System design

This project is designed and developed by using Python, Open-CV, Flask, MySQL, HTML, CSS, Bootstrap, Javascript, etc.

This project is divided into two parts:-

1. **Frontend:** UI/UX Part of the project
2. **Backend:** Logic and Integration with Database

3.2 Architecture

This project is divided into two parts as defined above.

3.2.1 Frontend: UI/UX Part of the project

I have used HTML, CSS, Javascript, Bootstrap for the design part of the project with the Python Flask web framework.

- HTML, CSS is used for basic web page structure and styling like heading, table, image, form, etc with best style like border, padding, margin, color, etc.
- Javascript is used to add the features in the table like searching, pagination, sorting, filtering, etc.
- Bootstrap is mainly used to make the website completely responsive using grid and other components so users can access it with any device like Desktop, Tablet, Mobile devices, etc.

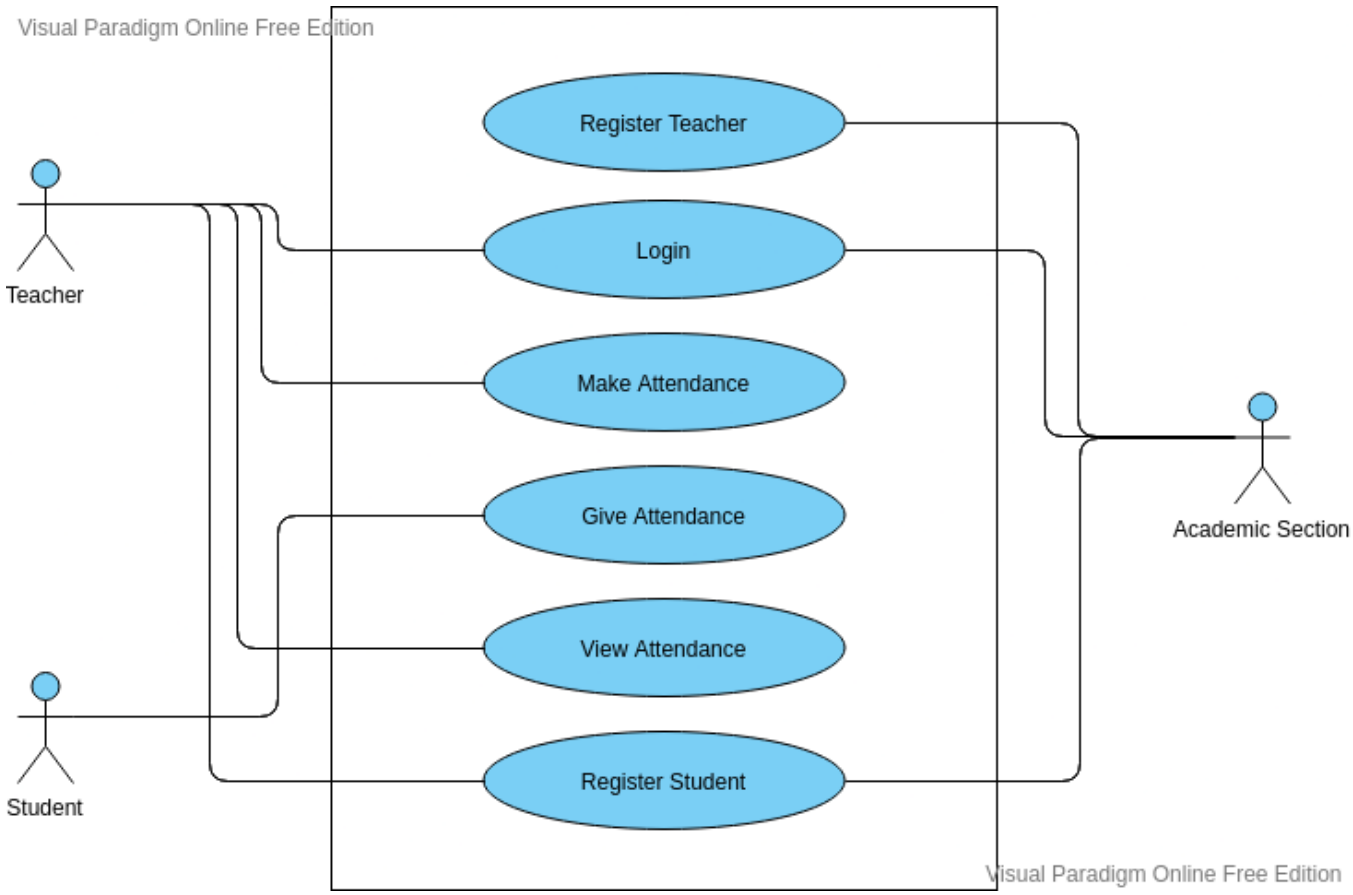
3.2.2 Backend: Logic and Integration with Database

I have used Python, Open-CV, Flask, Mysql to access the webcam, backend part, and database part of the project.

- Flask Web Framework is used to run the python and open-CV code with the web environment and store the result in the database.

- Python and Open-CV is used to write the logic to access the webcam and recognize faces from video to take attendance etc.
- MySQL is used to store the results in the database using the Flask framework of Python.

3.3 UML Diagram



Chapter 4

Implementation

4.1 Environment Set-up and Packages Installation

Basic Packages that need to install in the system:

- **Python** should be installed in our system
- **Flask Python** Web framework should be installed in our system
- **MySQL and Python-Mysql** packages should be installed in our system
- **Open-CV** should be installed in our system
- **Dlib python** package should be installed in our system

Setup the python virtual environment and activate it for the project:

- python m venv my_env
- source my_env/bin/activate

Install the all the required packages in local project directory using pip:

1. pip install flask
2. pip install opencv-python
3. pip install flask-mysqldb
4. pip install Flask-Session
5. pip install numpy

4.2 Files and Folders required in the project directory

- **App.py** file for eriting all the flask, database, python, open-CV related code
- **Template** folder for put all the HTML website structure related files

- **Static** folder for put all the media files
- **RegImg** folder to put images of the student using student registation form

4.3 Function/Module description

Teacher Details:

Registration of the teachers by the academic section and storing the related data into database like teacher's email, name, password etc.

So the teacher can log in to take the attendance by putting some details like which batch, semester and subject he/she wants to take attendance.

Attendance Details:

After putting the details of the attendance by the teacher the camera is on or we can put a video of the class for the attendance.

With the webcam or video when the system identifies the student and puts the related attendance details into the database like Teacher's email, batch, semester, subject, date, name of the student, roll number and time of attendance, etc.

Student Details:

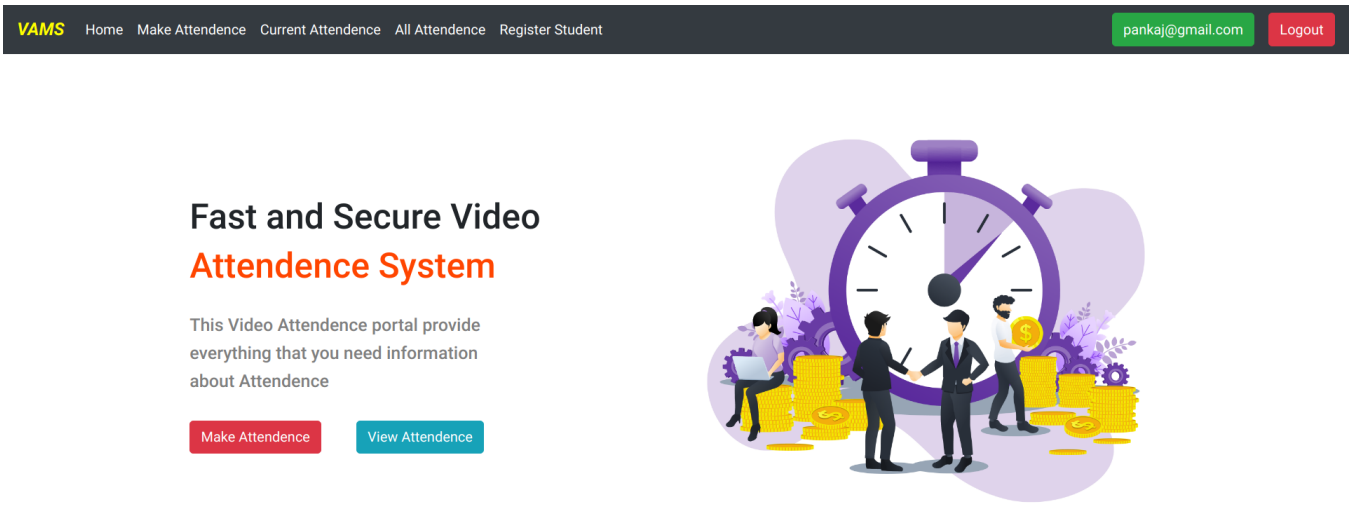
Registration of the students is done by the teacher or the academic section with some fields like image, name, roll number, etc.

Chapter 5

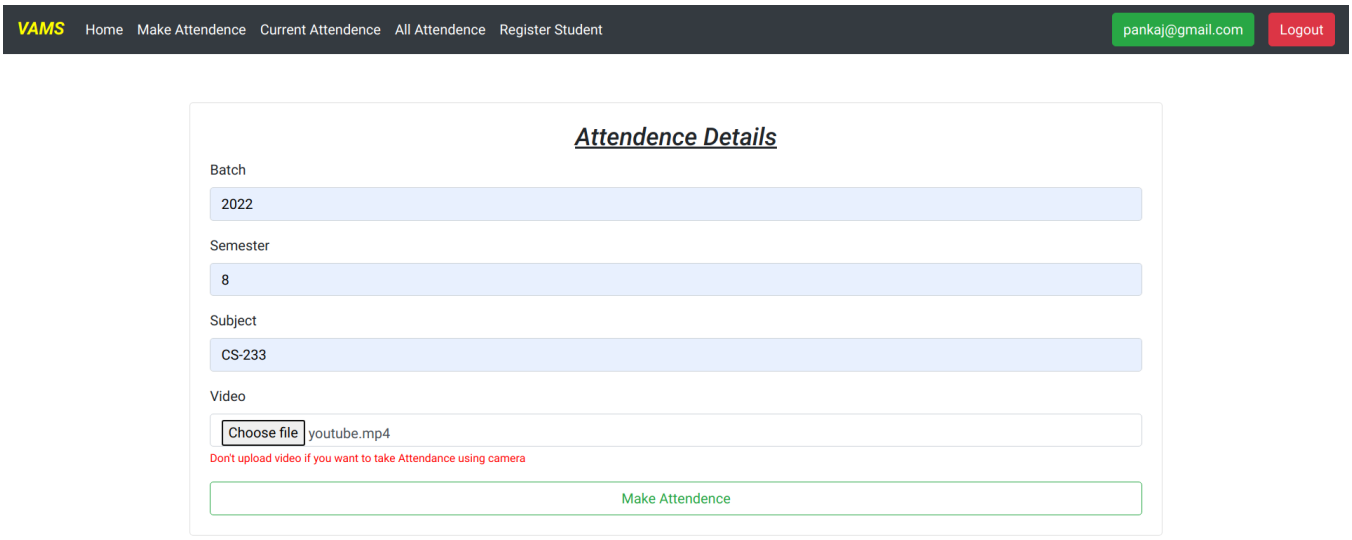
Result analysis and Conclusion

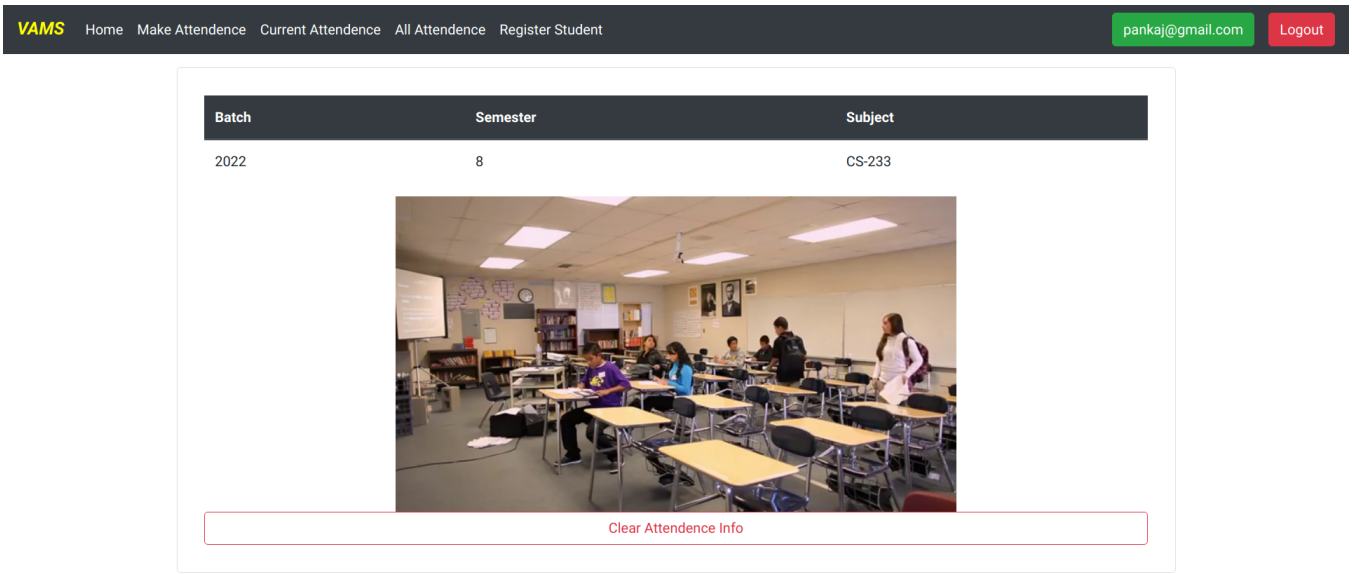
5.1 Result analysis

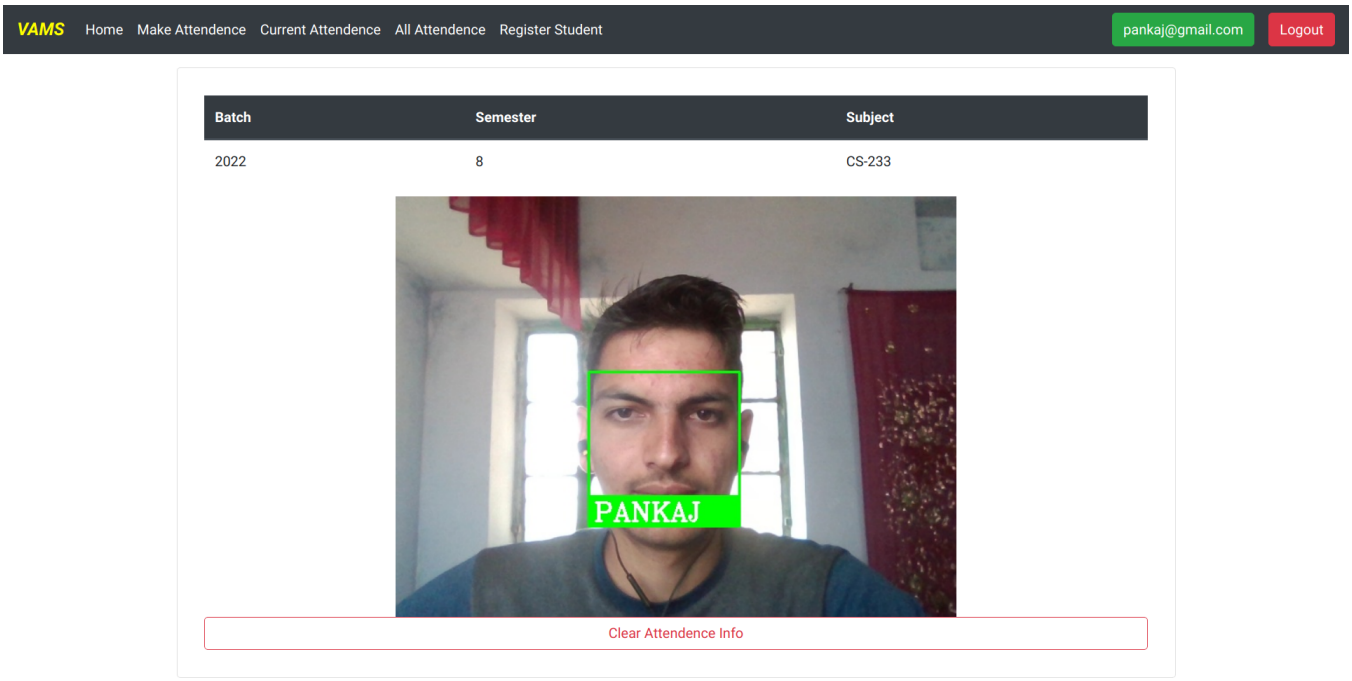
Home Page:-



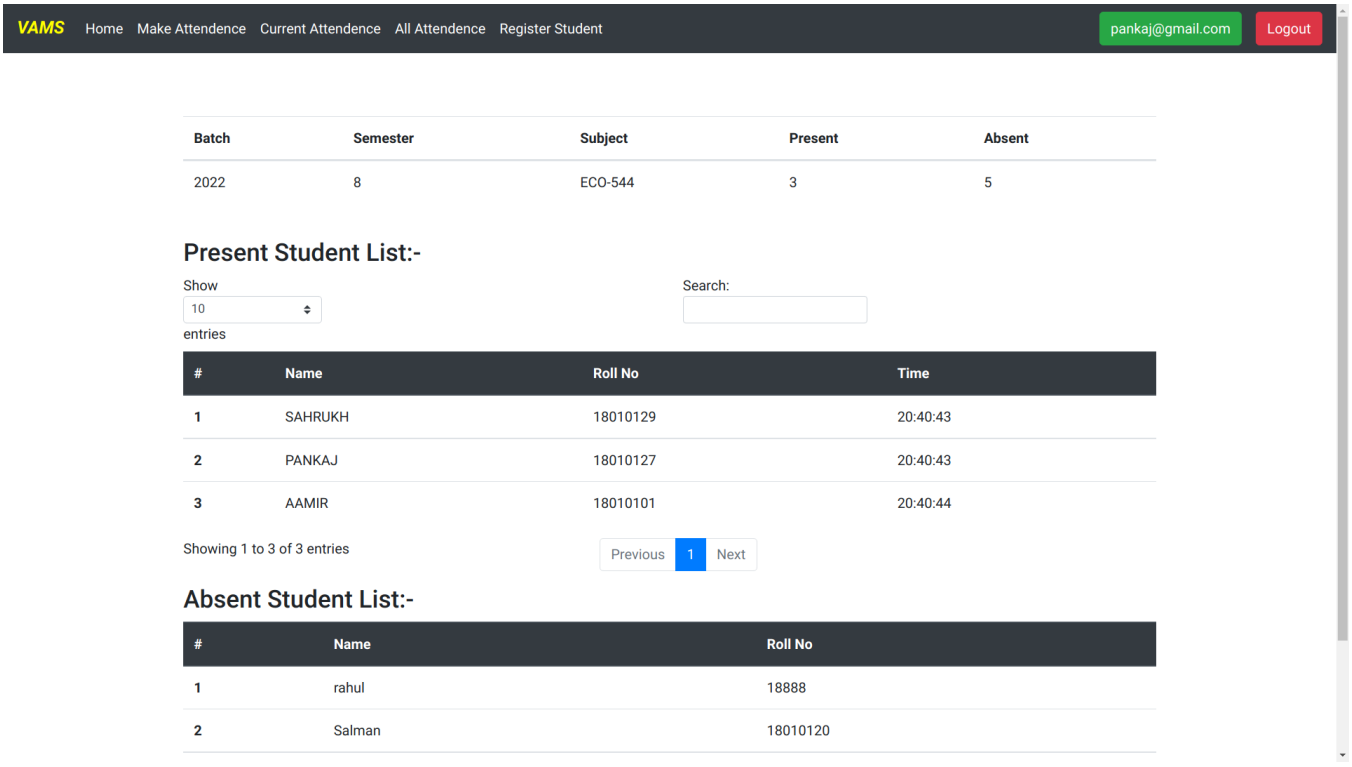
Make Attendance Page:-



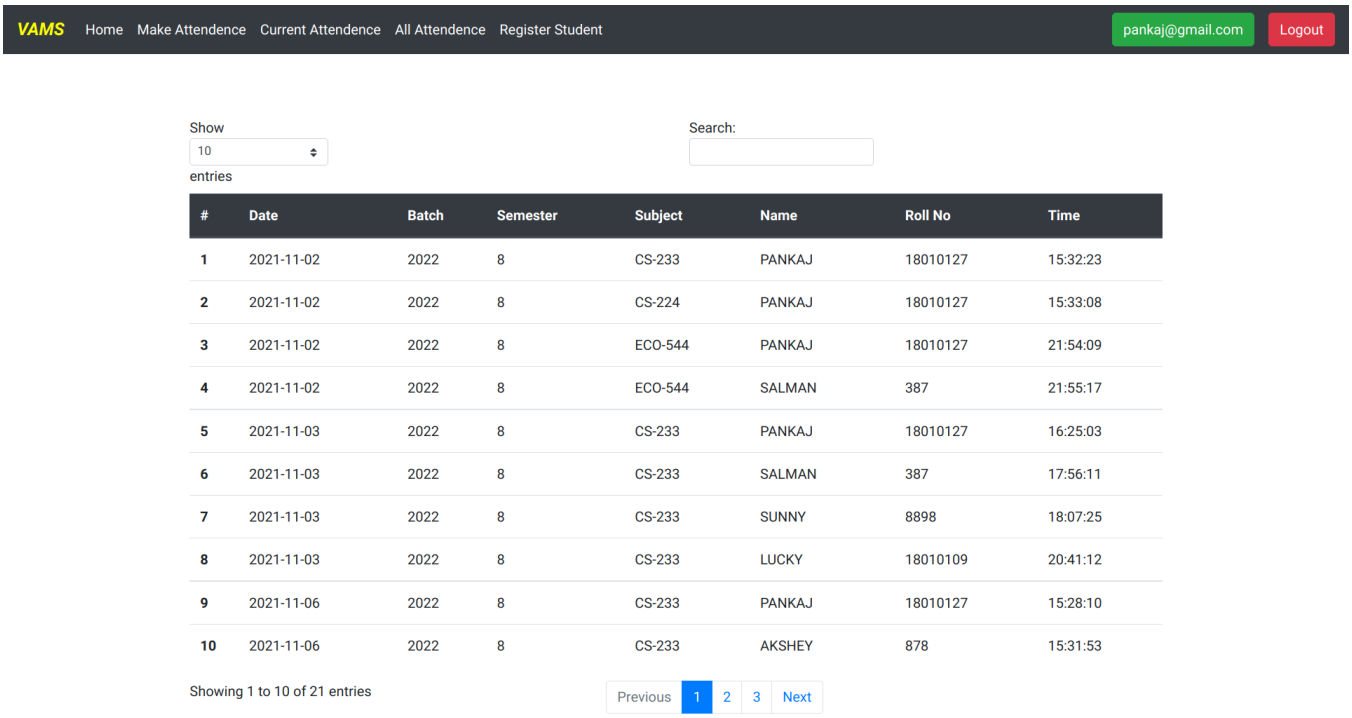




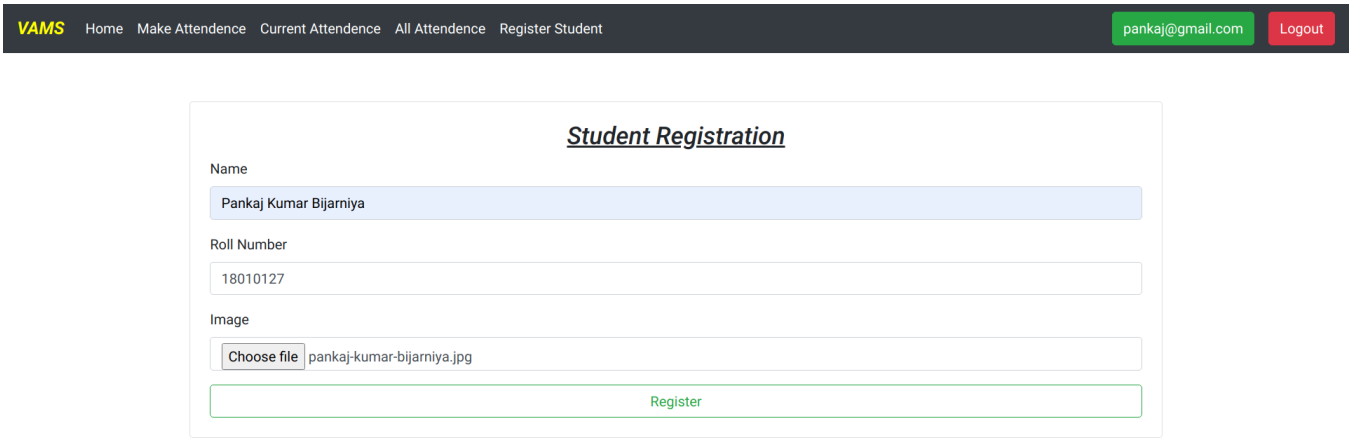
Current Class Attendance Page:-



All Attendance Page:-



Student Registration Page:-



5.2 Conclusion

Real-Time Video-Based Attendance System is used to mark the attendance for multiple students at the same time and store in the database so teachers can easily analyze the attendance of their class students.

It is very easy to set up the system because it is web-based software so just need to register students and teachers to start operating the system to take attendance.

References

[1] Python Documentation: Docs Link

[2] Open-CV Documentation: Docs Link

[3] Flask Web Framework Documentation: Docs Link

[4] MySQL Documentation: Docs Link