

AI based College Surveillance System for Class Skipper

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Abstract: *In many of the educational institutions, managing attendance of students/candidates is tedious, as there would be large number of students in the class and keeping track of all is onerous. There are situations where student act as proxies for their friends even though they are not present. The presence of students repeatedly skipping classes and spending considerable time wandering on campus signals potential underlying issues, such as disengagement, personal challenges, or dissatisfaction with the educational experience. Traditional methods of monitoring attendance are often inadequate in addressing these nuanced challenges. Therefore, there is a need for an AI-based College Surveillance System using Faster R-CNN to accurately detect class skippers and provide insights into their behavioural patterns. In this system, a database containing the trained student's face. A camera installed in the college campus captures the face of all the student in the classroom and other places too. This face image is processed using FRCNN algorithms to detect faces and to mark the attendance automatically in an excel sheet. The system records the entire class session and identifies when the students pay attention in the classroom, and then reports to the facilities and also this system can record violations of classroom, that is absence, roaming around the college campus during the class hours and send alert message to the H.O.D. This dynamic attendance system uses face recognition as an important aspect of taking attendance which saves time and proxy attendance and is avoided. The system identifies faces very fast needing only 100 milliseconds to one frame and obtaining a high accuracy. Our face recognition model has an accuracy rate of 98.87%..*

Keywords: Admin login, Staff login, Timetable, Attendance, User Friendly

I. INTRODUCTION

Attendance in schools involves students being present physically or virtually, as per the classroom setting. It's tracked using methods like biometric systems or digital registers. Teachers record attendance, which can impact grades. Monitoring attendance helps identify and address issues leading to absenteeism, such as health or personal problems.

II. PROBLEM STATEMENT

“Attendance significantly impacts students’ academic performance. Consistent absence increases the risk of failure and dropout. Traditional methods like calling names or paper sign-ins are time-consuming and insecure. Automated systems, such as fingerprint, RFID, iris, and face recognition, improve efficiency. Video surveillance with AI enhances security by analyzing real-time feeds and providing early warnings.”

III. PROPOSED SYSTEM

The paper suggests an automated attendance system using surveillance cameras and face recognition technology. Cameras installed across campus areas, including classrooms and common spaces, will identify students’ faces using a deep learning model, marking their presence for specific courses and times.

FaceNet Model Integration

The FaceNet model is seamlessly integrated, involving video capture, frame preprocessing, face detection, feature extraction, CNN-based face recognition, and deployment with Faster R-CNN. This ensures high accuracy in face identification.

Real-time Face Identification Module

A dedicated module enables real-time face identification during live video feeds in classrooms and campus areas. This contributes to the overall automation of attendance processes, enhancing efficiency.

Face Recognition and Attendance Automation

The system utilizes FaceNet for precise face recognition, enabling automated attendance tracking. Real-time identification during class hours ensures accurate and efficient attendance management.

Behavioral Analysis with Faster R-CNN

Faster R-CNN is employed for behavioral analysis, detecting patterns like class skipping or unusual activities. This feature provides administrators with proactive insights into student engagement and potential challenges.

College Admin Dashboard

Login Page

Secure login page for College Admin with username and password fields.

Admin Home Page

Centralized dashboard for College Admin to manage departments, semesters, syllabus, students, staff, login credentials, face enrollment, timetable, attendance viewing, report generation, and notification customization.

Department Management

Page for adding and managing departments with an organized list of existing departments.

Student Management

Form for adding and managing student details, coupled with a list and options to edit or delete.

Staff Management

Form for adding and managing staff details with an organized list for easy editing or deletion.

Enroll Student Face

Dedicated page for capturing and enrolling student faces for attendance.

Timetable Management

Functionality to manage and organize class timetables for different departments and semesters.

View Attendance

Page to select department, semester, and date for viewing attendance records in a tabular format.

Generate Report

Form to select parameters for generating attendance reports with downloadable options.

Staff Dashboard

Login Page

Secure login portal for staff members with appropriate credentials.

Staff Home Page

Dashboard for staff to view timetable, student attendance, class skipper details, and images of roaming students.

View Timetable

Page displaying the timetable for the staff member's classes.

View Attendance

Page to select department, semester, and date to view attendance records in a tabular format.

Class Skipper Details

Page displaying details of students who have skipped classes, including images and additional information.

View Image of Students Roaming

Page displaying images of students found roaming around the college during class hours.

HOD Dashboard

Login Page

Secure login portal for the Head of the Department (HoD) with proper credentials.

HOD Home Page

Dashboard for HOD to view timetable, student attendance, class skipper details, and images of roaming students.

View Timetable

Page displaying the timetable for the HoD's department.

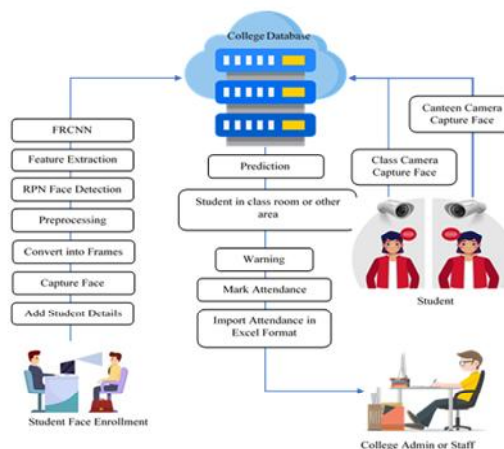
View Attendance

Page to select department, semester, and date to view attendance records in a tabular format.

Class Skipper Details

Page displaying details of students who have skipped classes, including images and additional information.

IV. SYSTEM ARCHITECTURE



V. IMPLEMENTATION WORK

Operating System:

Windows 10

Web Development:

Python for backend development

Flask as the web framework for building web applications

HTML, CSS, and JavaScript for frontend development (Bootstrap for responsive design)

Database:

MySQL for storing student information, attendance records, and system data

Machine Learning and Computer Vision:

TensorFlow for deep learning tasks (including FaceNet)

OpenCV for image and video processing

Scikit Learn for additional machine learning tasks

Data Analysis and Visualization:

Pandas for data manipulation

Matplotlib and Seaborn for data visualization

Image Processing:

Pillow for image processing tasks

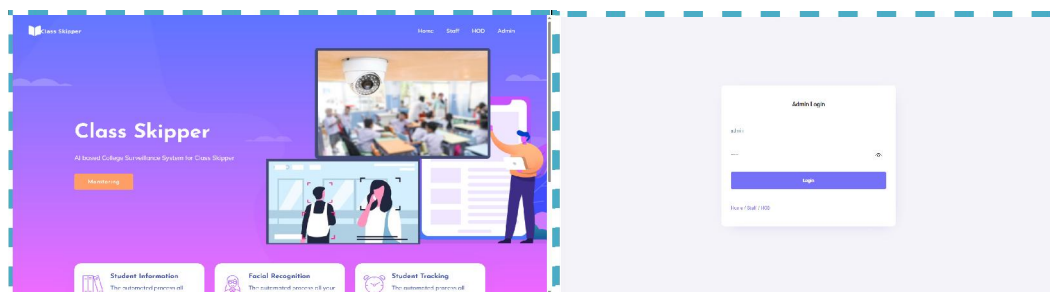
Development Environment:

Wampserver for local development (if using Windows)

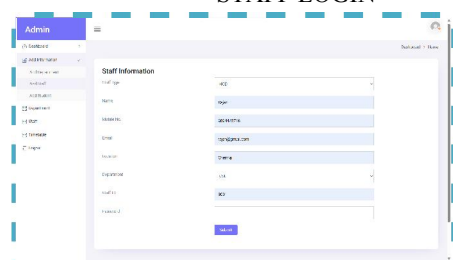
Virtual environments for Python projects

V. RESULTS

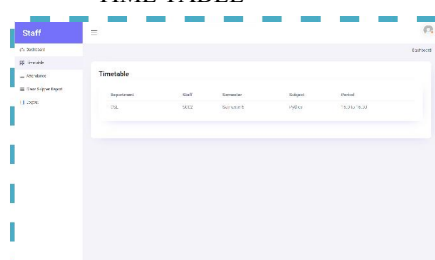
HOME PAGEADMIN LOGIN



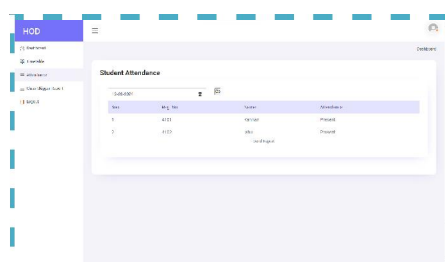
STAFF LOGIN



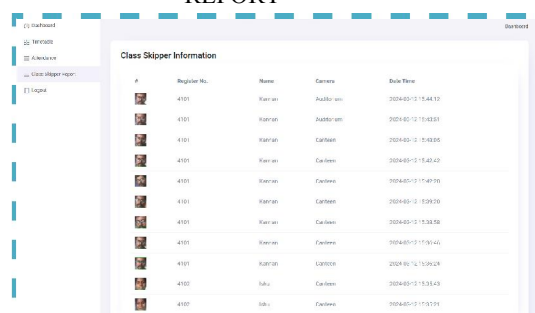
TIME TABLE



HOD LOGIN



REPORT



VI. CONCLUSION

The AI-based College Surveillance System, utilizing technologies like Faster R-CNN and FaceNet, transforms attendance management and behavioral analysis in education. It automates attendance, detects behavioral patterns, and promotes discipline, offering a comprehensive solution for modern educational institutions. This system signifies a leap in educational technology, ensuring a secure and efficient learning environment.

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