A Report On

Attendance System Using Face Recognition

Submitted in partial fulfillment for

Mini-Project IV and V

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Declaration

I, hereby declare that the dissertation report entitled **"Attendance system using face recognition"** submitted by me to **Walchand College of Engineering, Sangli** in fulfillment of the requirement for the award of the degree of **Bachelor of Technology (B. Tech)** in **Information Technology** is a record of bonafide project work carried out by me under the guidance of Dr**. U. B. Chavan.**

I further declare that the work reported in this project has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university. I declare that this dissertation report reflects my thoughts about the subject in my own words. I have sufficiently cited and referenced the original sources, referred to or considered in this work. I have not misrepresented or fabricated or falsified any idea/data/fact/source in this submission. I understand that any violation of the above will be cause for disciplinary action by the Institute.

Acknowledgment

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CERTIFICATE

This is to certify that the mini-project work entitled

"Attendance System Using Face Recognition"

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In partial fulfillment of the requirement for the degree of

Bachelor of Technology

In

INFORMATION TECHNOLOGY

From

Walchand College of Engineering, Sangli

(An Autonomous Institute)

This mini-project work is a record of student's team work carried out under my supervision and guidance during the session 2022-23.

Dr. U. B. Chavan (Guide)

Dr. R. R. Rathod (HOD)

External Examiner

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Introduction

To maintain the attendance record with day-to-day activities is a challenging task. The conventional method of calling name of each student is time consuming and there is always a chance of proxy attendance. The following system is based on face recognition to maintain the attendance record of students. The daily attendance of students is recorded subject wise which is stored already by the administrator. 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. We 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. The main objective of this project is to develop face recognition based automated student attendance system. In order to achieve better performance, the test images and training images of this proposed approach are limited to frontal and upright facial images that consist of a single face only. The test images and training images have to be captured by using the same device to ensure no quality difference. In addition, the students have to register in the database to be recognized. The enrolment can be done on the spot through the user-friendly interface.

Overview and Problem Statement:

To develop an automated attendance system using face recognition. Concept In a classroom with large number of students, it is a very tedious and time-consuming task to take the attendance manually. Therefore, we can implement an effective system which will mark the attendance of students automatically by recognizing their faces. The process of this face recognition system is divided into various steps, but the important steps are detection of face and recognition of face. Firstly, to mark the attendance of students, the image of students' faces will be required. This image can be snapped from the camera device, which will be placed in the classroom at a suitable location from where the whole classroom can be covered. This image will act as input to the system. For the effective face detection, the image needs to be enhanced by using some image processing techniques like grayscale conversion of image and histogram equalization. To identify the students sitting on the last rows neatly, the histogram equalization of image needs to be done. Hence, there is a need to develop a real time operating student attendance system which means the identification process must be done within defined

time constraints to prevent omission. The extracted features from facial images which represent the identity of the students have to be consistent towards a change in background, illumination, pose and expression. High accuracy and fast computation time will be the evaluation points of the performance.

Project Objectives:

To identify the student faces accurately. To mark the attendance automatically. To reduce the time and the efforts required for manual attendance to provide a valuable attentive system for both teacher and students. It provides flexibility and reduces the time loss. There will be no chance for a proxy.
The objective of this project is to develop face recognition based automated student attendance system. Expected achievements in order to fulfill the objectives are:

- To detect the face segment from the video frame.
- To extract the useful features from the face detected.
- To classify the features in order to recognize the face detected.
- To record the attendance of the identified student.

Technology

Machine learning algorithms be used to train the system to recognize specific hand gestures. This can improve the accuracy of the system over time.
In this we have used the OpenCV python library and the Packages we used are media pipe and cvzone.

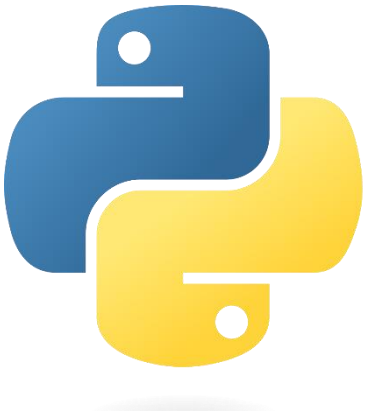


Figure 1.1

Platform

Figure 1.2

Performance Study

All the students of the class must register themselves by entering the required details and then their images will be captured and stored in the data set. During each session, faces will be detected from live streaming video of classroom. The faces detected will be compared with images present in the data set. If match found, attendance will be marked for the respective student. The task of the proposed system is to capture the face of each student and to store it in the database for their attendance. The face of the student needs to be captured in such a manner that all the feature of the students' face needs to be detected, even the seating and the posture of the student need to be recognized. There is no need for the teacher to manually take attendance in the class because the system records a video and through further processing steps the face is being recognized and the attendance database is updated.

Method:

Define the scope and requirements of the project: Determine what features the attendance system should have, such as the ability to recognize multiple faces at once, track attendance over time, and integrate with existing school or workplace systems. Establish the hardware and software specifications for the system.

Collect and label a dataset of faces: Gather a collection of images that will be used to train the face recognition algorithm. These images should be labeled with the names of the people in the photos.

Train the face recognition algorithm: Use machine learning techniques to train a face recognition model on the labeled dataset. There are several libraries and tools available for this, such as OpenCV, TensorFlow, and PyTorch.

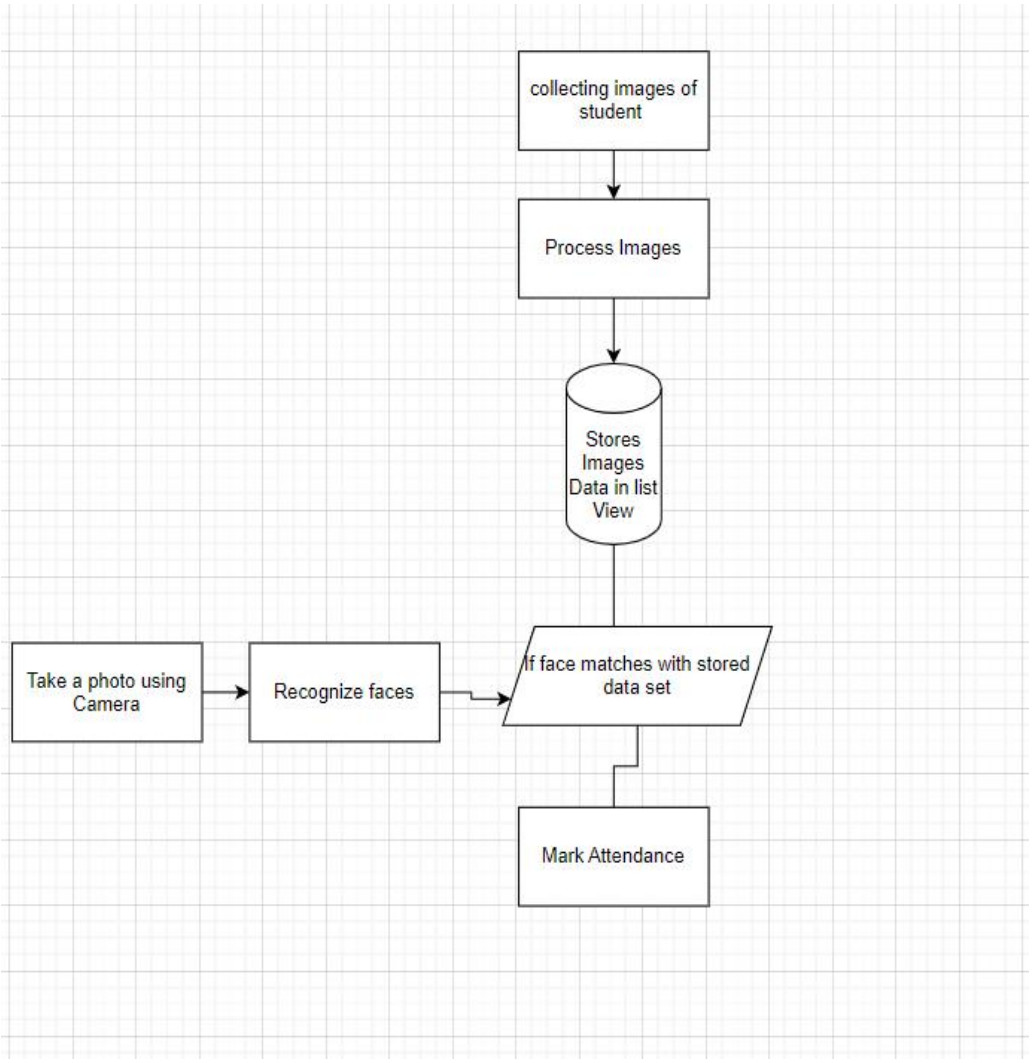
Develop the attendance system software: Write the software that will use the face recognition algorithm to track attendance. This could be a standalone application or integrated into an existing system. Consider the user interface and how the attendance data will be stored and reported.

Test and evaluate the system: Test the system with a group of users and evaluate its accuracy and performance. Collect feedback and make improvements as necessary.

Deploy and maintain the system: Install the attendance system and provide support to users as needed. Monitor the system for issues and make updates as necessary to ensure continued accuracy and reliability.

Continuously improve the system: Consider adding new features or improving the system over time as user needs evolve and technology advances.

Flowchart:



Flowchart

Implementation / Simulation (add photos)

Face Detection :

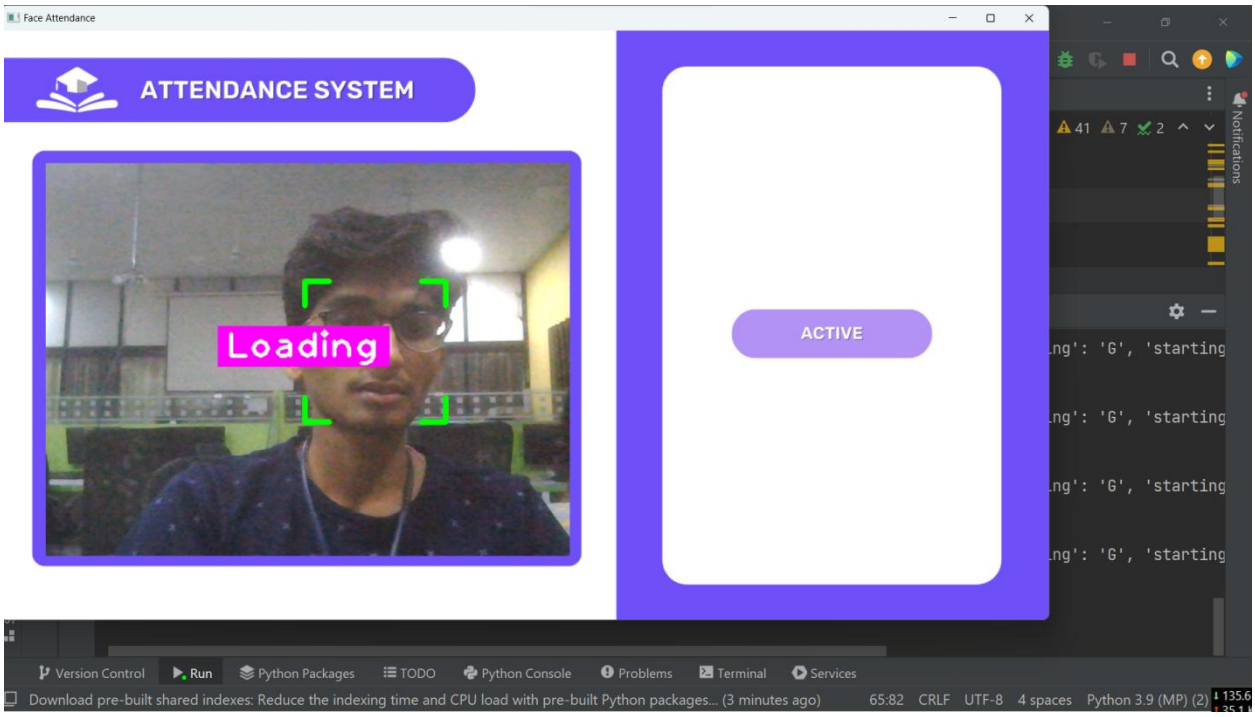


Figure 1.3

Mark Attendance :

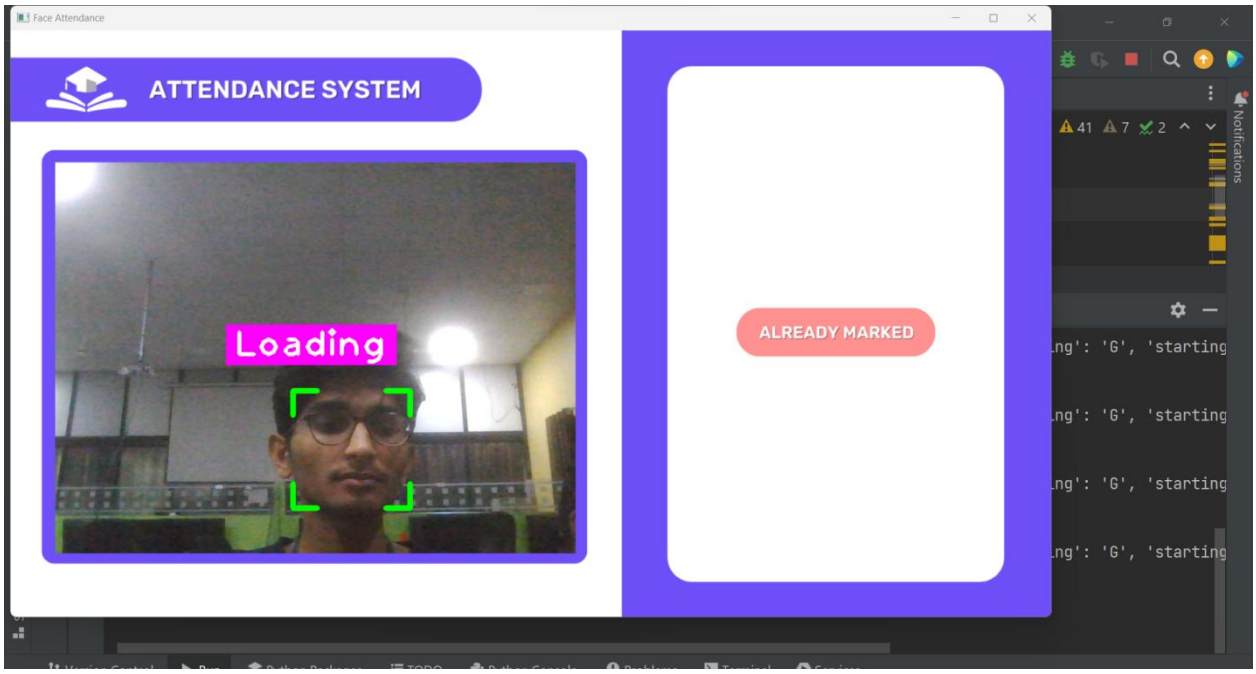


Figure 1.4

Image Storage :

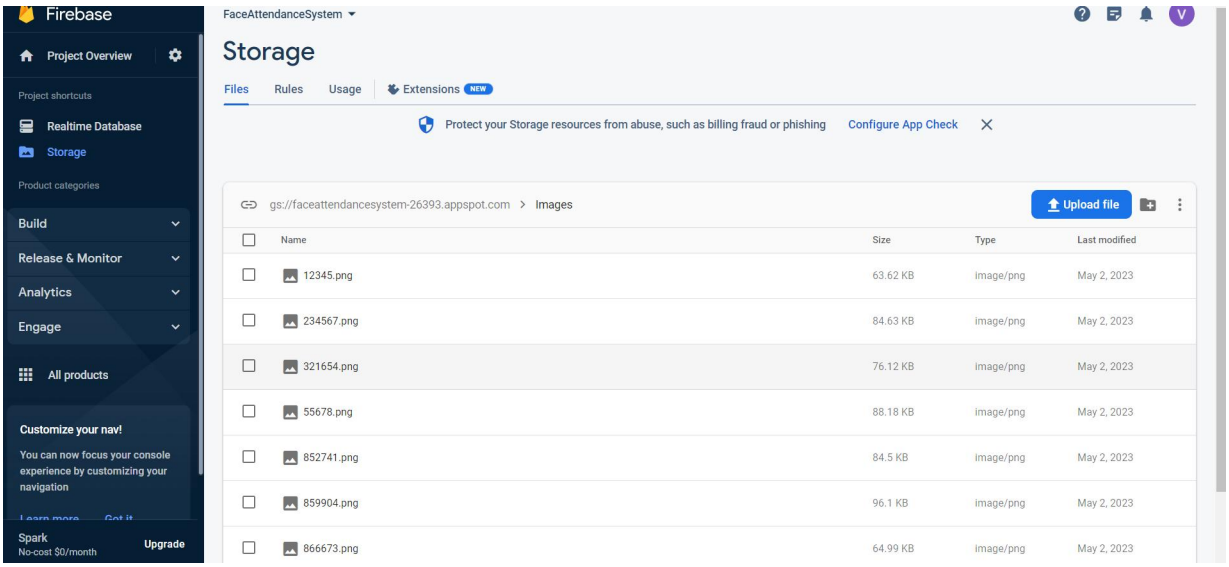


Figure 1.5

Realtime Database :

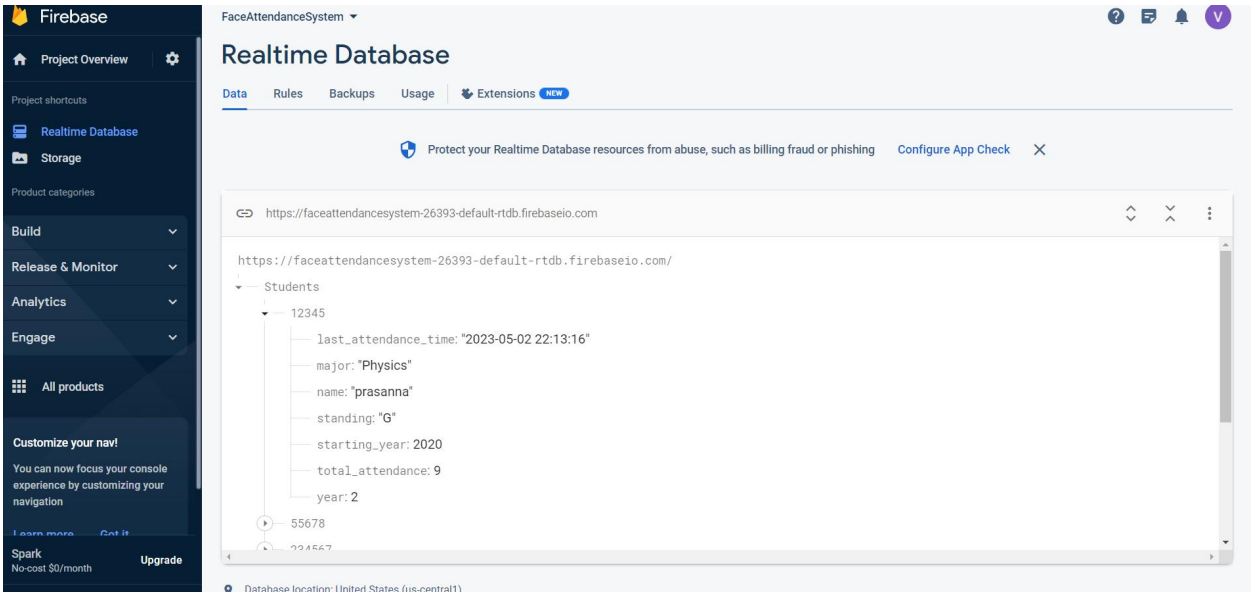


Figure 1.6

Future Scope:

Improved accuracy: With further advancements in computer vision technology, the accuracy of face recognition systems is likely to improve, leading to more reliable attendance tracking.
Integration with other systems: Face recognition attendance systems can be integrated with other systems such as payroll, HR, and student management systems. This will streamline administrative tasks, reduce errors and improve data management.
Contactless attendance: Face recognition technology eliminates the need for physical contact during attendance tracking, making it ideal for use in healthcare settings, schools, and other environments where hygiene is important.
Customizable reporting: Attendance data collected using face recognition technology can be used to generate reports that can provide insights into employee or student attendance trends, allowing managers to make data-driven decisions**.**

Conclusion:

In conclusion, the attendance system using face recognition is a promising solution to the traditional attendance-taking method. By utilizing the latest technology in facial recognition, the system can accurately and efficiently record attendance without the need for physical contact or manual input.The project has been successful in achieving its objectives, which include

developing an algorithm for facial recognition, integrating the system with a database, and creating a user-friendly interface for easy operation. The system has been tested and evaluated, and the results show that it is reliable and accurate in recognizing faces and recording attendance.The system's benefits include increased security, reduced human error, and time-saving. With its high accuracy rate, it eliminates the possibility of proxy attendance and false records. The system's implementation can save time and resources for companies and institutions by automating the attendance-taking process.

Reference

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