GUJARAT TECHNOLOGICAL UNIVERSITY
Chandkheda, Ahmedabad

Affiliated

SAL EDUCATION CAMPUS

SAL College of Engineering

"Attendance system using face recognition"

A Report

Submitted By

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Under Subject of

SUMMER INTERNSHIP (3170001)

Of

BACHELOR OF ENGINEERING

In

Information Technology

Under the guidance of

Prof. Vijaysinh Jadeja

Academic Year
2022-23

SAL COLLEGE OF ENGINEERING

Information Technology
2022

CERTIFICATE

Date:

This is to certify that the "**Attendance system using face recognition**" has been carried out by **Shah Fenil Niteshbhai (191130116085)** under my guidance in completion of Summer Internship in Computer Branch 7th Semester of Gujarat Technological University, Ahmedabad during the academic Year 2022-23.

Prof. Vijaysinh Jadeja
Internal Guide
Information Technology
SCE

Prof. Vijaysinh Jadeja
Head of Department
CE, IT & ICT Department
SCE

GUJARAT TECHNOLOGICAL UNIVERSITY

CERTIFICATE FOR COMPLETION OF ALL ACTIVITIES AT ONLINE PROJECT PORTAL

B.E. SEMESTER VII, ACADEMIC YEAR 2021-2022

Date of certificate generation : 22 July 2022 (16:52:09)

This is to certify that, ***Shah Fenil Niteshbhai*** (Enrolment Number - 191130116085) working on project entitled with ***Attendance system using face recognition*** from ***Information Technology*** department of ***SAL COLLEGE OF ENGINEERING*** had submitted following details at online project portal.

Internship Project Report	**Completed**

Name of Student : Shah Fenil Niteshbhai

Name of Guide : Mr. Vijaysinh Kishorsinh Jadeja

Signature of Student : _____

*Signature of Guide : _____

Disclaimer :
This is a computer generated copy and does not indicate that your data has been evaluated. This is the receipt that GTU has received a copy of the data that you have uploaded and submitted as your project work.

*Guide has to sign the certificate, Only if all above activities has been Completed.

Acknowledgement

We have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. We would like to extend our sincere thanks to all of them.

We are highly indebted to **Prof Vijaysinh Jadeja** for their guidance and constant supervision as well as for providing necessary information regarding the project. We take this opportunity to thank all our friends and colleagues who started us out on the topic and provided extremely useful review feedback and for their all-time support and help in each and every aspect of the course of our project preparation. We are grateful to our college SAL College of Engineering, Ahmedabad for providing us all required resources and a good working environment.

We would like to express our gratitude towards Head of Department, **Prof Vijaysinh Jadeja** and Principal, **Dr Bhavna Soni** for their kind cooperation and encouragement which helped us in this project.

Shah Fenil Niteshbhai

(191130116085)

Abstract

In this digital era, the face recognition system plays a vital role in almost every sector. Face recognition is one of the mostly used biometrics. It can be used for security, authentication, identification, and has many more advantages. Despite having low accuracy when compared to iris recognition and fingerprint recognition, it is being widely used due to its contactless and non-invasive process. Furthermore, face recognition systems can also be used for attendance marking in schools, colleges, offices, etc. This system aims to build a class attendance system which uses the concept of face recognition as the existing manual attendance system is time consuming and cumbersome to maintain. And there may be chances of proxy attendance. Thus, the need for this system increases. This system consists of four phases- database creation, face detection, face recognition, attendance updation. Database is created by the images of the students in class. Face detection and recognition is performed using the Haar-Cascade classifier and Local Binary Pattern Histogram algorithm respectively. Faces are detected and recognized from live streaming video of the classroom.

Table of Content

CHAPTER 1. INTRODUCTION TO PROJECT

Traditional method of attendance marking is a tedious task in many schools and colleges. It is also an extra burden to the faculties who should mark attendance by manually calling the names of students which might take about 5 minutes of the entire session. This is time consuming. There are some chances of proxy attendance. Therefore, many institutes started deploying many other techniques for recording attendance like use of Radio Frequency Identification (RFID), iris recognition, fingerprint recognition, and so on. However, these systems are queue based which might consume more time and are intrusive in nature. Face recognition has set an important biometric feature, which can be easily acquirable and is non-intrusive. Face recognition based systems are relatively oblivious to various facial expressions. Face recognition system consists of two categories: verification and face identification. Face verification is an 1:1 matching process, it compares face image against the template face images and whereas is an 1:N problem that compares a query face image.

CHAPTER 2. PURPOSE

The main purpose of this work is to make the attendance marking and management system efficient, time saving, simple and easy. Instead of using the conventional methods, this proposed system aims to develop an automated system that records the student's attendance by using facial recognition technology. It includes better security, easy integration, and automated identification. This technology automatically takes time like when the student arrives and when he/she leaves the class. Here we are saving trees because we are not using any kind of paper for taking attendance. It gives us more accurate and worker attendance. Easy to Manage. Smart Integration.

CHAPTER 3. OBJECTIVE

3.1 SCOPE :-

Advantages :-

- ⇀ Ease of use.
- ⇀ Save time and effort.
- ⇀ Proxy system is totally eliminated.
- ⇀ Used for security purposes.
- ⇀ Multiple face detection.
- ⇀ Multiple face recognition.
- ⇀ Unknown faces are identified
- ⇀ As the system stores the faces that are detected during registration and automatically marks attendance faster. Providing authorized access.

Limitation :-

- ⇀ Expensive
- ⇀ Difficulties with big data processing and storing without gpu and RAM below 4GB
- ⇀ Weak camera angle, low-lighting ad image quality
- ⇀ Deluded by identical twins

3.2 TECHNOLOGY AND LITERATURE REVIEW :-

Technology :-

- Python
- CCTV Camera or Webcam
- HD Monitor
- HTML
- CSS
- Javascript
- Bootstrap
- Python Libraries :-
  - Pandas
  - Numpy
  - Tensorflow
  - Dlib
  - Os
  - OpenCV-Python
  - Flask

Literature Review :-

Automated attendance systems using face recognition have gained significant attention due to their efficiency and potential to replace traditional manual methods. These systems aim to identify students automatically through facial detection and recognition techniques, thus maintaining accurate attendance records without human intervention. The proposed system captures the facial images of students as they enter the classroom and matches them with stored data to mark their attendance. This approach not only saves time but also improves monitoring accuracy.

CHAPTER 4. IMPLEMENTATION

4.1 IMPLEMENTATION PLATFORM :-

Server side :-

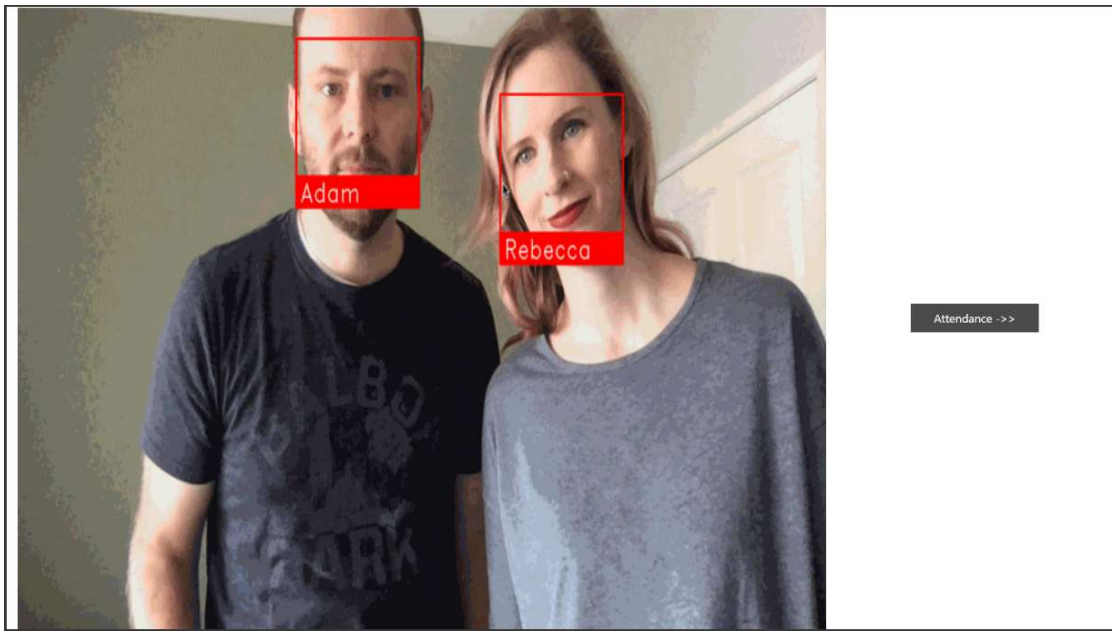
- Python
- CSV files
- Json file
- Python libraries :-
  - flask
    - Flask
    - Render_template
    - Response
    - Request
    - Send_file
    - jsonify
  - OpenCV-Python
  - numpy
  - face_recognition
  - Os
  - Datetime
    - Datetime
    - date
  - Werkzeug.utils
    - secure_filename
  - json
  - pandas

Client side :-

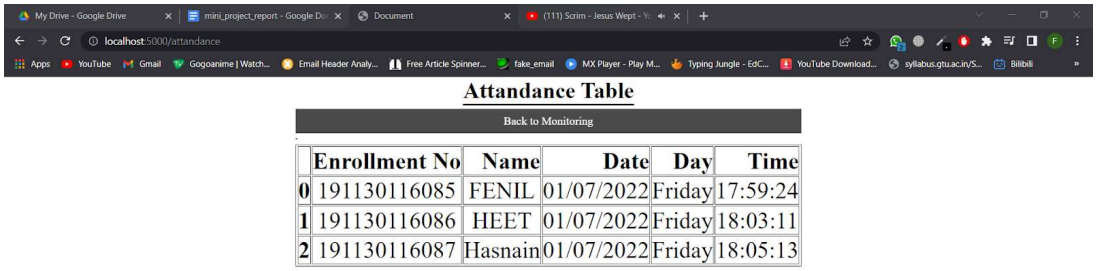
- HTML
- CSS
- Javascript

CHAPTER 5. SYSTEM SCREENSHOTS

5.1 MONITORING PAGE :-



5.2 ATTENDANCE REVIEW FOR STUDENT :-

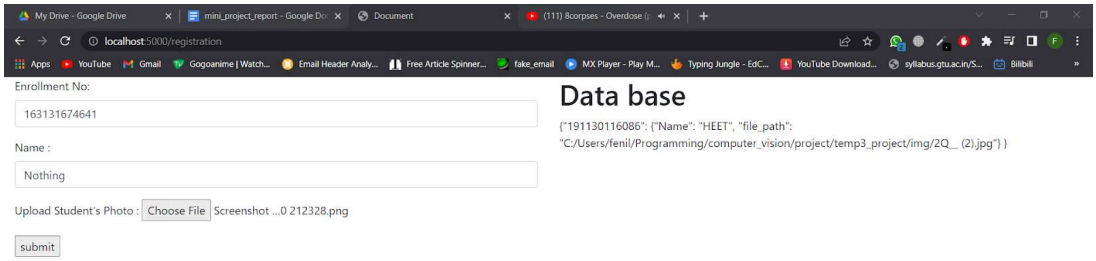


Attandance Table

Back to Monitoring

	Enrollment No	Name	Date	Day	Time
0	191130116085	FENIL	01/07/2022	Friday	17:59:24
1	191130116086	HEET	01/07/2022	Friday	18:03:11
2	191130116087	Hasnain	01/07/2022	Friday	18:05:13

5.3 INSERTING STUDENT INFO :-



5.4 FOR DOWNLOADING THE ATTENDANCE :-

URL :- http://localhost:5000/download

5.5 FINAL ATTENDANCE FOR FACULTY :-

main_attandance.csv

Enrollment No	Name	Date	Day	Arrival Time	Last Seen	Total Time Spen
191130116085	FENIL	10/07/2022	Sunday	21:42:14	17:59:20	0:14:1
191130116086	HEET	10/07/2022	Sunday	21:42:14	18:11:11	0:8:00
191130116087	Hasnain	01/07/2022	Friday	18:05:13	20:00:47	2:5:34

CHAPTER 6. CONCLUSION

- The system stores the faces that are detected and automatically marks attendance.
- Ease of use.
- Multiple face detection.
- Provide methods to maximize the number of extracted faces from an image.
- Provide authorized access.
- Manipulate and recognize the faces in real time using live video data.
- Multipurpose software.
- Can be used in different places.
- Convenient.
- High accuracy.
- Provide many recognition ways.

REFERENCES

- **Web reference link**
  - https://pypi.org/project/face-recognition/
  - https://www.w3schools.com/python/python_ml_getting_started.asp
- **Bootstrap link**
  - https://cdn.jsdelivr.net/npm/bootstrap@5.2.0-beta1/dist/js/bootstrap.bundle.min.js
  - https://cdn.jsdelivr.net/npm/bootstrap@5.2.0-beta1/dist/css/bootstrap.min.css
- **Book**
  - Python Machine Learning
  - Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems