A Mini Project Report

On

FACE RECOGNITION ATTENDANCE SYSTEM WITH TEMPERATURE SENSING

Submitted in partial fulfilment of the requirement of

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For the Degree of

Bachelor of Engineering (SE)

in

COMPUTER ENGINEERING

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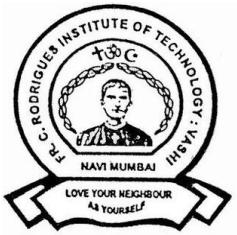

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2022-2023

APPROVAL SHEET

This is to certify that the Mini project entitled

"FACE RECOGNITION ATTENDANCE SYSTEM WITH TEMPERATURE SENSING"

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Date : / /2023

Place: Vashi

Declaration

We declare that this written submission for S.E. Mini Project entitled ”**Face recognition attendance system with temperature sensing** ” represent our ideas in our own words and where others’ ideas or words have been included. We have adequately cited and referenced the original sources. We also declared that we have adhere to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any ideas / data / fact / source in our submission. We understand that any violation of the above will cause for disciplinary action by institute and also evoke penal action from the sources which have thus not been properly cited or from whom paper permission have not been taken when needed.

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Abstract

Every college faculty spends huge amount of time on recording the attendance and marking the presence of students, staff, employees which gives us the idea of building this project so that their effort and time consumption might be reduced. Face recognition attendance system is a very smart system which allows us to store data as well as mark the attendance in a user friendly way by using OpenCv, Tkinter and MySQL database. As we all know that from past few years the deadly coronavirus has struck throughout the world which has made us more cautious about health and its precaution, hence we introduced a new feature of temperature sensing which allow us to sense our temperature along with recording attendance. This is a severe problem faced by the colleges, officies, etc. This study aims at understanding the reasons and remedies to this problem.

In this application user can input, update, delete or access all the details regarding the student. It can mark the attendance of the user and also import and export the csv file containing the attendance details.

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Chapter 1

Introduction

This project contains five parts. First is login panel. Second one is student management system, third one face recognition, fourth is attendance management system and fifth is the temperature sensing. In login panel, student can login using the username and password. After that admin can add his/her details in the student management system and also the student can see all registered students. In this app, student needs to login using username and password, users need to register themselves with whatever information asked by this application. Then the student can mark their attendance by clicking on the face recognition button which open the camera window and displays your name. The student can also access the excel file of attendance by clicking on the attendance button. Using this project the student can also get to know about the current body temperature by simply coming in contact with the temperature sensor.

1.1 Background

As we all know, attendance system are a better alternative for traditional practice of attendance sheet. It helps in reducing the wastage of paper used for marking the attendance by storing all the data in computer memory. When the teacher needs to access the details about any student, it can be easily read in the management system and not waste their time by finding the details in a book registry. The rise in awareness about the virus spread make us take all the precautions and safety regarding the coronavirus, where temperature sensor helps us to tell the current body temperature.

1.2 Motivation

Thumb-based attendance systems have often failed in situations where the fingerprint is faded. That is not the case with face recognition attendance. It has been tried, tested and proven that it is practically 100% accurate. With covid-19, the world has become increasingly aware of the risks of contact-based

attendance systems. There is no attendance system, other than face id attendance system which is absolutely touch free. The user has to simply show his face. The system is triggered automatically. Even after the world is covid-free, people will be conscious of the touches they make and it will be good to provide a hygienic system.

1.3 Aim and Objective

This project contains five parts. First is login panel. Second one is student management system, third one face recognition, fourth is attendance management system and fifth is the temperature sensing. In login panel, student can login using the username and password. After that admin can add his/her details in the student management system and also the student can see all registered students. In this app, student needs to login using username and password, users need to register themselves with whatever information asked by this application. Then the student can mark their attendance by clicking on the face recognition button which open the camera window and displays your name. The student can also access the excel file of attendance by clicking on the attendance button. Using this project the student can also get to know about the current body temperature by simply coming in contact with the temperature sensor.

1.4 Report Outline

Chapter 1 Covers the necessary introduction and the reason as to why we selected this topic for our project. It also covers what we want to achieve through this project.

Chapter 2 Comprises the literature survey of many research papers about mental health issue, followed by a comparative analysis between the systems.

Chapter 3 Contains the problem statement, scope and the system requirements for the proposed system, it contains the necessary features that have to be incorporated within the system.

Chapter 4 Contains the necessary blueprints of the proposed system such as flowchart.

Chapter 5 discusses the takeaways about this project and the future scope of what can be achieved through it.

Chapter 2

Study of the System

2.1 Literature Survey

2.1.1 Contactless Attendance Tracking using Face Recognition and Sensor:

Idea mentioned in the paper

Stepping out of home without mask is impossible in today's situation due to the global pandemic. This crisis has forced the world to shut down affecting its economy, day-to-day routine, and people's livelihood. Today, people are adapting to this new normal in a gradual manner. Therefore, making contactless attendance tracking and screening is an essential part in all the organizations. This will be solved by building a technology which will do multiple functions like detecting faces of people with their masks on and reading their body temperature involving various techniques computer vision and deep learning using Python, OpenCV, and TensorFlow/Keras and also some sensors like Infrared Temperature Sensor. The output values of these modules will be uploaded in cloud storage and can be viewed remotely. It is highly possible to reduce the spread of the virus and promote social distancing as per the government norms by using such technology driven solutions. The aim of this paper is to provide a technical review on such existing technologies and suggesting some solutions for additional features.

Chapter 3

Proposed System

3.1 Problem Statement

Our college faculty spends huge amount of time on recording the attendance and marking the presence of students, staff, employees which gives us the idea of building this project so that their effort and time consumption might be reduced. Face recognition attendance system is a very smart system which allows us to store data as well as mark the attendance in a user friendly way by using OpenCv and MySQL database. The study aims at understanding the reasons and remedies to this problem.

There are three main factors that need attention to improve in student management system, face recognition and temperature sensing. These three factors are:

1. Adding of the student's image in student management system.
2. Detecting unknowns and showing alert sign
3. Collecting data of temperature

❖ **Face recognition attendance system with temperature sensing:-**

Our project is divided into five parts

A. Login panel
B. Student management system
C. Face recognition
D. Attendance management system
E. Temperature sensing

Login Panel:-

In login panel, admin can login using the username and password. The username and password are already defined. If you forgot the login details it can be accessed by clicking on the forgot password button. After logging in the user can access all the 3 parts of this project.

Student management system:-

In this system, users need to first register themselves with whatever information asked by this application if they have not done that. The student can save, update, delete, and reset the data. All the data gets stored into the database. This is implemented using the MySQL Workbench and Visual studio code.

Face recognition:-

Here the student can mark their attendance by clicking on the face recognition button. The camera window pops up and captures their face, the face structure is converted into encoding and this data is compared with the saved image encodings in the system and the name of the student in displayed. Along with this the attendance is marking in a CSV file which contains the name of the student, time, date, and present status.

Attendance management system:-

In this system, when the student clicks on the attendance button, Tkinter window opens where the student can import and export the CSV file that contains the attendance details. This is implemented using the module Tkinter.

Temperature sensing:-

In this system, the student can get to know his/her current body temperature by simply placing their hand in front of the temperature and proximity sensor. When anyone comes in range of the IR sensor it activates the temperature sensor, the temperature sensor then displays the temperature on the OLED display.

3.2 Scope

All the faculty who prefers traditional attendance marking has bared the time consuming process of marking all the attendance by themselves. It can be replaced by the face recognition attendance system which contains more features like contact-less attendance marking, less time consuming, reduces wastage of papers, etc.

This can be improved be adding the three factors i.e. Adding of the students image in student management system, Detecting unknowns and showing alert sign ,Collecting data of temperature in the database.

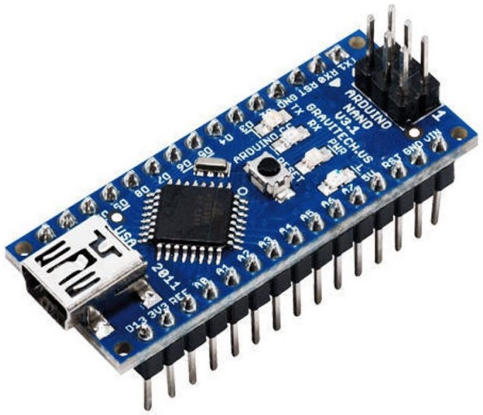
3.3 Hardware Components

1. (Intel(R) Core(TM) i5-4310U CPU @ 2.00GHz 2.60 GHz, 64-bit operating system, x64-based processor, Windows 10 Pro)

3.3.1Desktop Computer

2. **ARDUINO NANO**

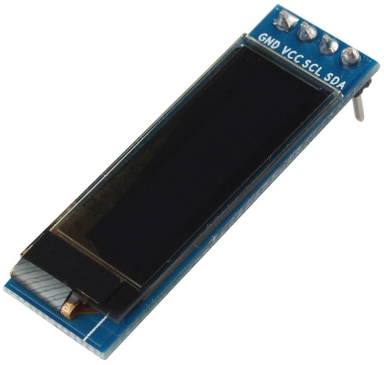
The Arduino Nano is a small Arduino board based on ATmega328P or ATmega628 Microcontroller. The Arduino Nano is organized using the Arduino (IDE), which can run on various platforms. We operated Nano on 5V supply. We integrated arduino nano with all the components for the temperature sensing application.



3.3.2Arduino nano

3. OLED DISPLAY

This 0.91 inch 128×32 Blue OLED Display Module offers 128×32 pixel resolution. They have less thickness with good brightness and produce true colors. The OLED display was used to display the output from the arduino nano, ie. “Please come in proximity”, “Critical body temperature” if the temperature was greater than 102, “body temperature” when it’s normal temperature.



3.3.3. OLED display

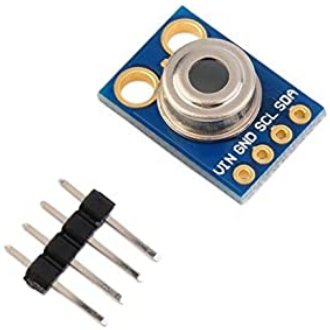
4. PEIZO BUZZER

A Piezo buzzer is a type of electronic device that's used to produce a tone, alarm or sound. The piezo buzzer was used to generate sound if the body temperature of the user was great than 102 degree celsius.

3.3.4 Piezo buzzer

5. TEMPERATURE SENSOR MLX 90614

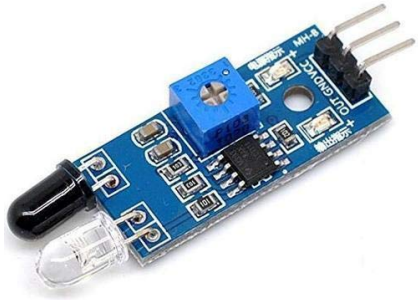
The MLX90614 is a Contactless Infrared (IR) Digital Temperature Sensor that can be used to measure the temperature of a particular object ranging from -70° C to 382.2°C, It has measurement resolution of 0.02°C. The MLX90614 sensor can measure the temperature of an object without any physical contact with it.



3.3.5 Temperature sensor

6. IR SENSOR

A proximity sensor is a sensor that detects the presence of nearby objects without any physical contact. We have used active IR sensor, when an object comes close to the sensor, the infrared light from the LED reflects off of the object and is detected by the receiver.



3.3.6 IR sensor

7. LM 358

The LM358 contains two independent high gain operational amplifiers, low power, and dual-channel op-amp. It can handle voltage from 3V to 32V DC supply and current up to 20mA per channel. It eliminates the need for a dual power supply, thus simplifying design and basic application use.

3.3.7 LM 358

3.4 Software Components

1. **Visual studio code**:

Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control.

3.4.1 Visual studio code

2. **Arduino IDE**

The Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such **as** Windows, Mac OS X, and Linux. It supports the programming languages C and C++. Here, IDE stands for **Integrated Development Environment**

3.4.2 Arduino IDE

Chapter 4

Design of the System

FACE RECOGNITION ATTENDANCE SYSTEM

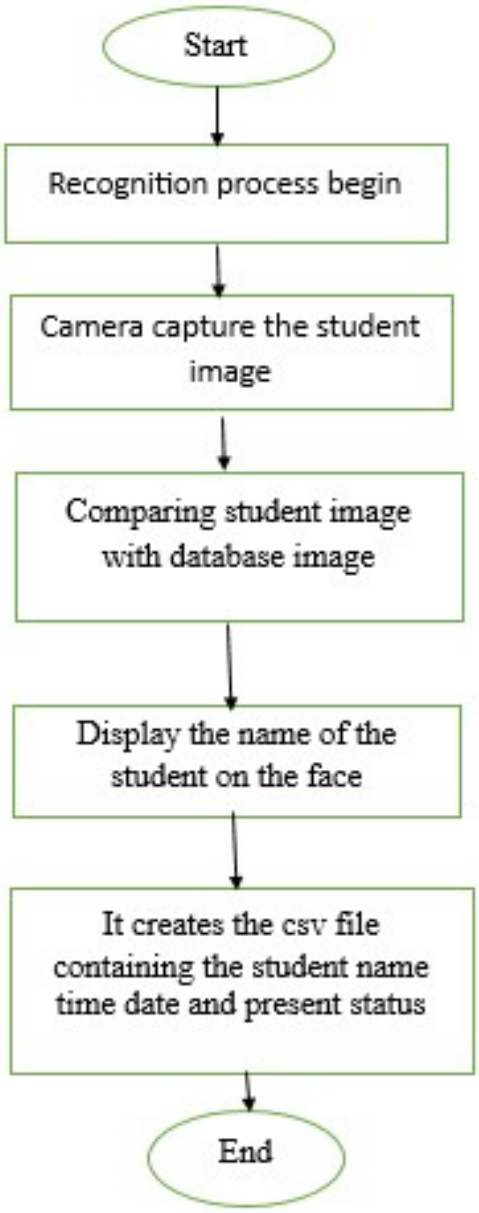


Fig 4.1 Face recognition attendance system

Face recognition attendance system is a very smart system which allows us to store data as well as mark the attendance in a user friendly way by using OpenCv,

Tkinter and MySQL database. Whenever a student wants to mark his/her attendance, they have to click on face recognition button. The camera window pops up and captures their face, face recognition process included converting the camera face structure into encoding and also converting the image of the student that is saved in the database into encoding. These data's are compared and the name of the student in displayed. Then the attendance is marking in a CSV file which contains the name of the student, time, date, and present status.

TEMPERATURE SENSING

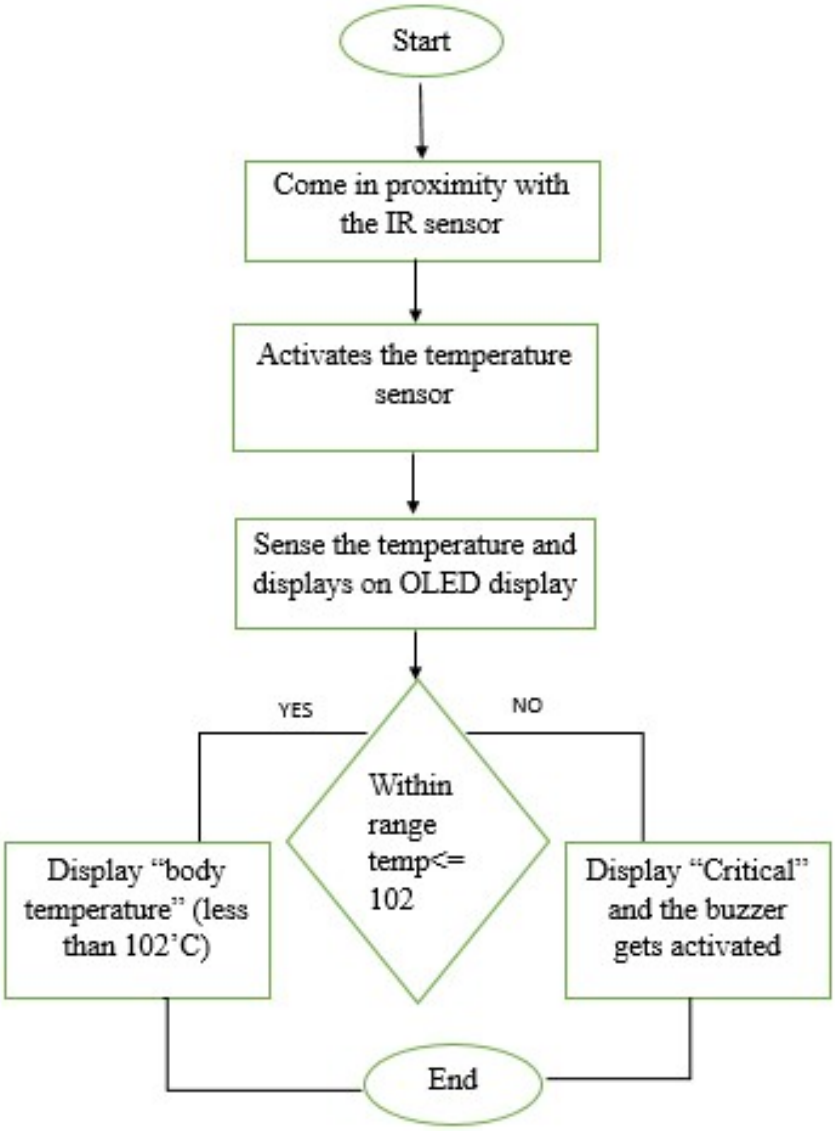


Fig 4.2 Temperature sensing

The temperature sensing process started when the student comes in contact with the IR sensor, the IR sensor then activates the temperature sensor and it starts observing the temperature of the

student. The display will simply show the body temperature of the student if it is in the range i.e. less than 102 deg Celsius. But if the body temperature of the student is more than 102 then it will display critical body temperature and also generates alarm using the piezo buzzer.

Chapter 5

Result and Discussion

- **LOGIN PANEL:-**

  In login panel, admin can login using the username and password. The username and password are already defined. If you forgot the login details it can be accessed by clicking on the forgot password button. After logging in the user can access all the 3 parts of this project.

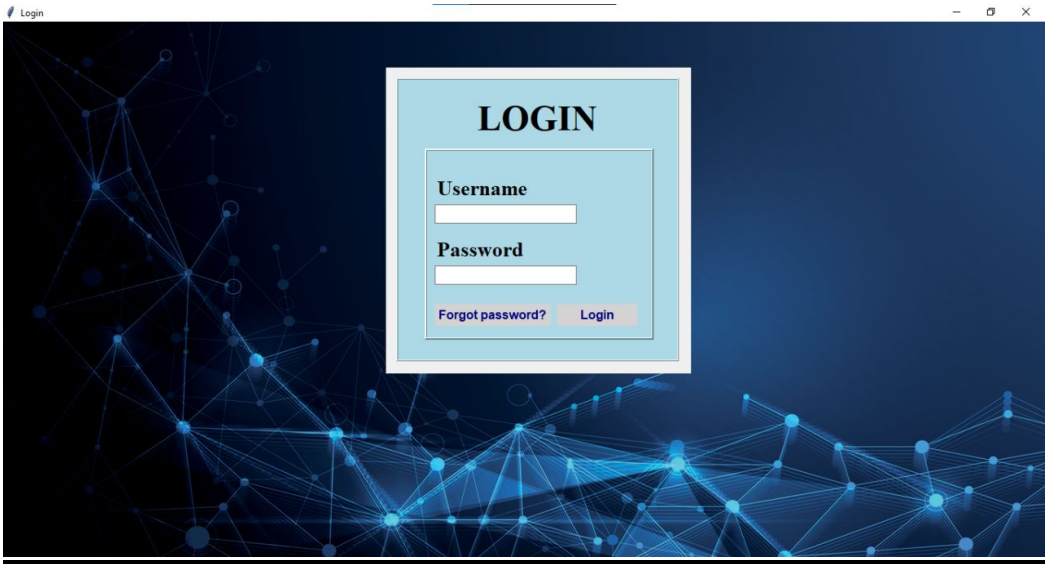


Fig 5.1 Login Panel

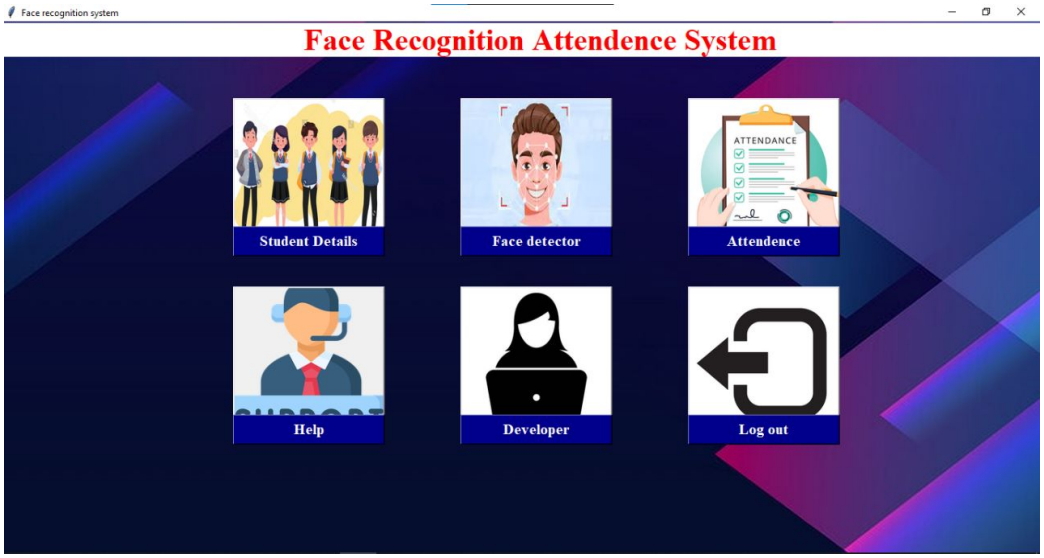


Fig 5.2 User options

- **STUDENT MANAGEMENT SYSTEM:-**

In this system, users need to first register themselves with whatever information asked by this application if they have not done that. The student can save, update, delete, and reset the data. All the data gets stored into the database. This is implemented using the MySQL Workbench and Visual studio code.

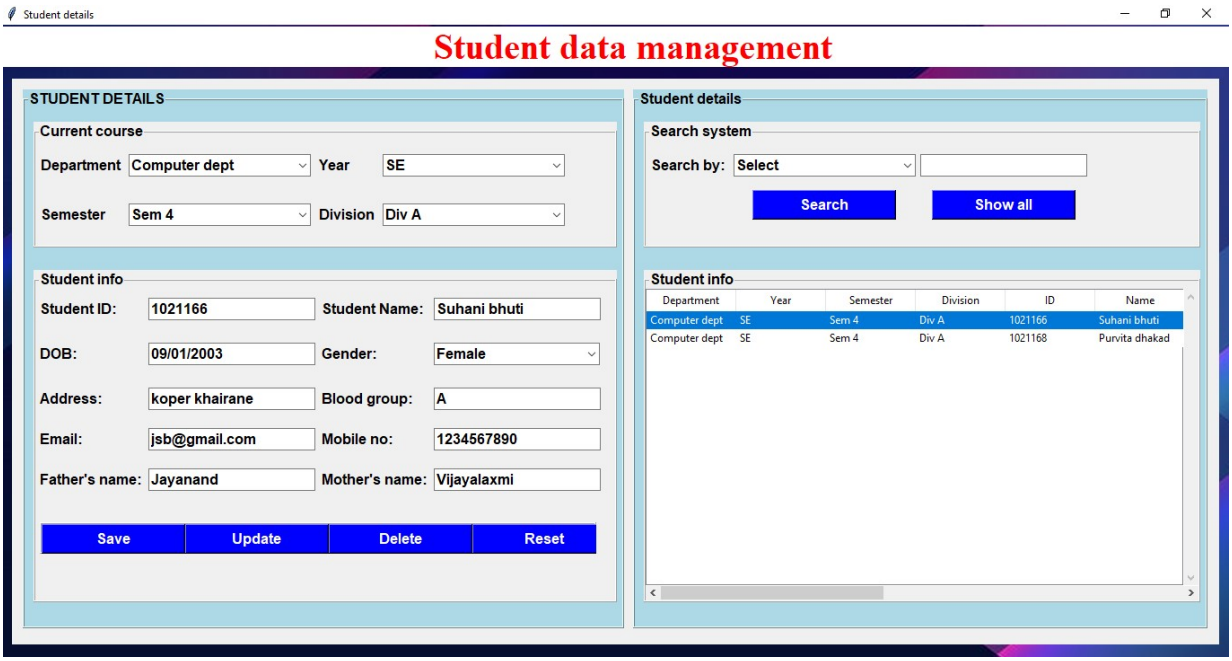


Fig 5.3 Student management system

- **FACE RECOGNITION:-**

Here the student can mark their attendance by clicking on the face recognition button. The camera window pops up and captures their face, the face structure is converted into encoding and this data is compared with the saved image encodings in the system and the name of the student in displayed. Along with this the attendance is marking in a CSV file which contains the name of the student, time, date, and present status.

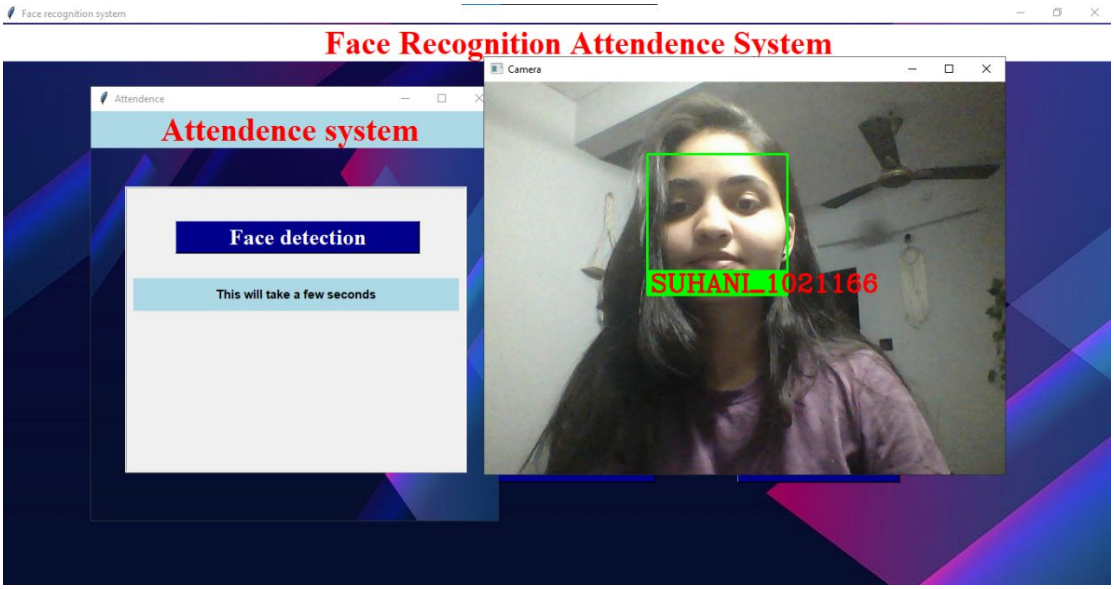


Fig 5.4 Face recognition

- **ATTENDANCE MANAGEMENT SYSTEM:-**

In this system, when the student clicks on the attendance button, Tkinter window opens where the student can import and export the CSV file that contains the attendance details. This is implemented using the module Tkinter.

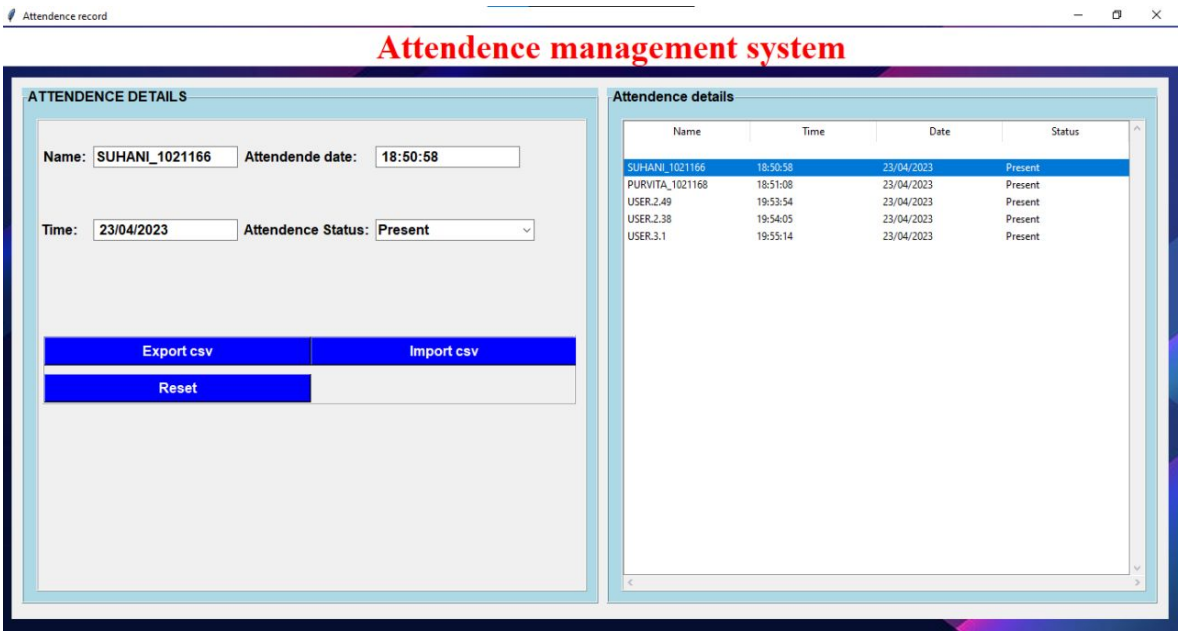


Fig 5.5 Attendance management system

- **HELP DESK AND DEVELOPER :-**

Using the help desk and developer window the user can get to know about developer and email id of the developer.

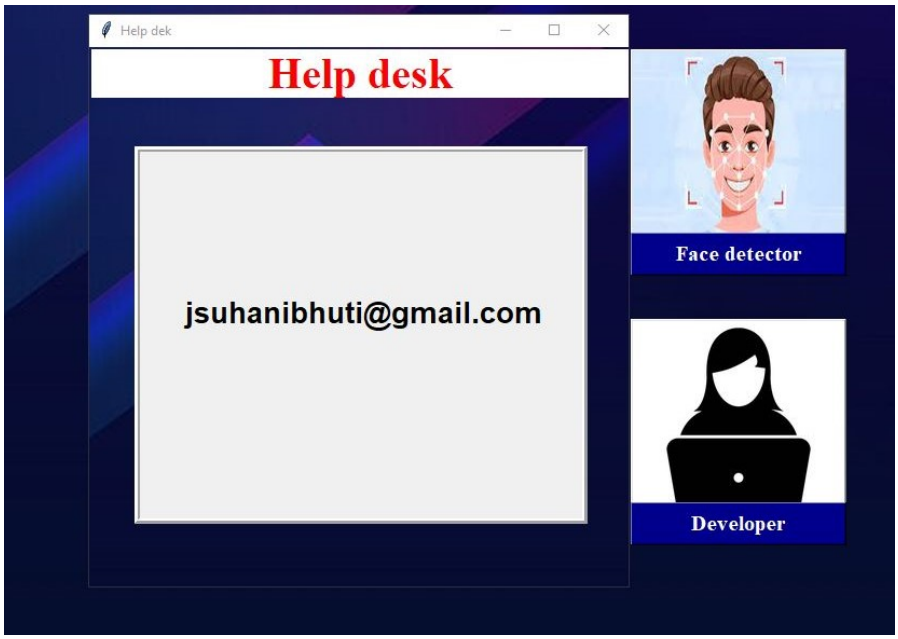


Fig 5.6 Help desk

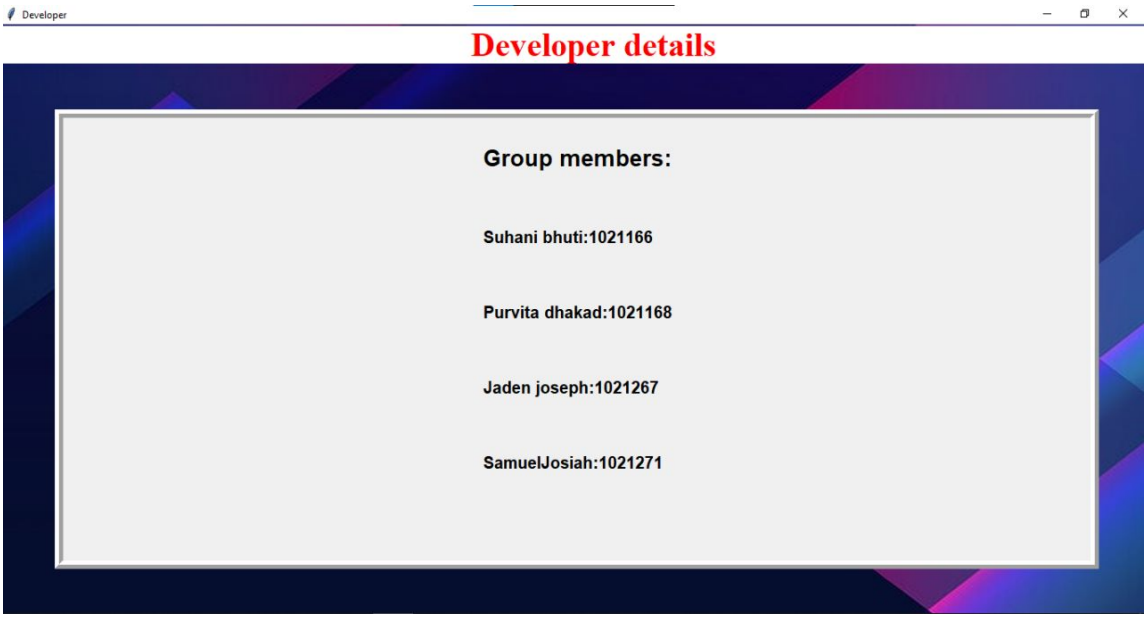


Fig 5.7 Developer

The below image is the snippet of MySQL Workbench which is displaying the data of two students and the description of the table (primary key, columns, data type, size) on the left side.

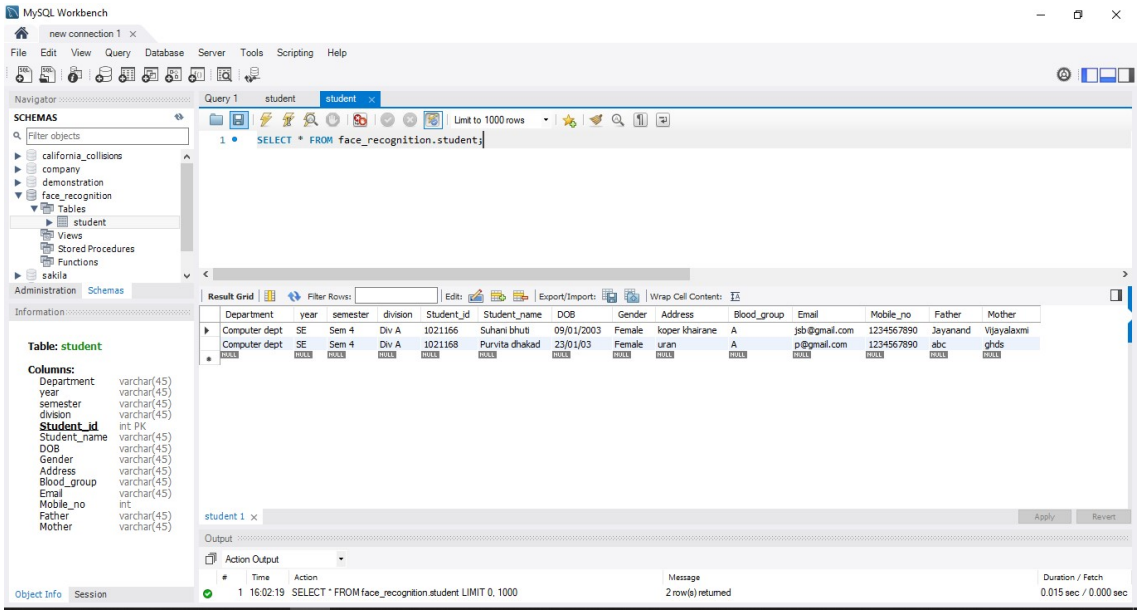


Fig 5.8 MySQL database

- **TEMPERATURE SENSING:-**

In this system, the student can get to know his/her current body temperature by simply placing their hand in front of the temperature and proximity sensor. When anyone comes in range of the IR sensor it activates the temperature sensor, the temperature sensor then displays the temperature on the OLED display.

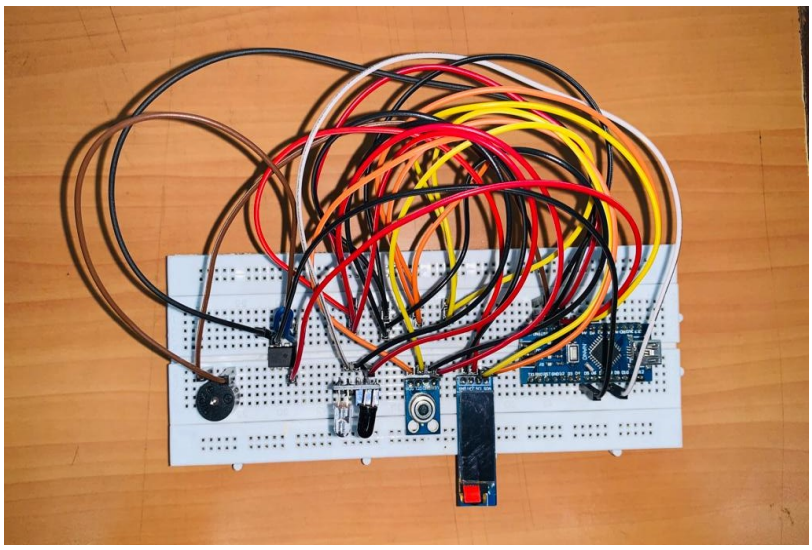


Fig 5.9 Hardware

This is the snippet of the OLED display, in first image it is telling the user to come in proximity and in another it is displaying the temperature of the user.

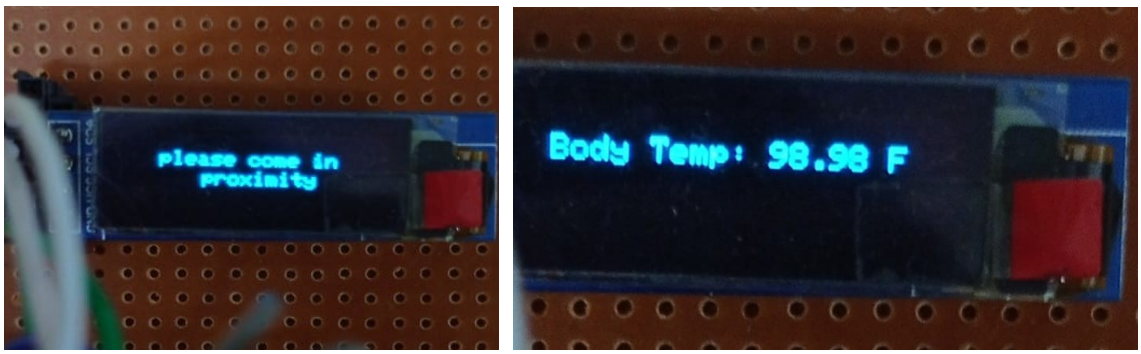


Fig 5.10 Temperature display

In this snippet, the OLED display is indicating that the temperature of the user is critical ie,more than 102 degree celcius.

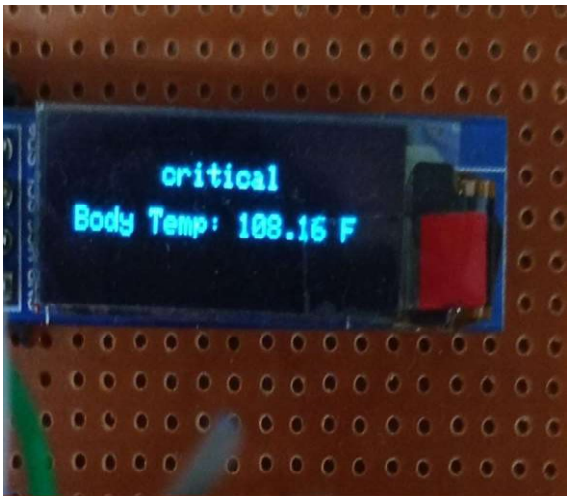


Fig 5.11 Critical temperature

Chapter 6

Conclusion and Future Scope

Conclusion

The attendance system are a better alternative for traditional practice of attendance sheet. It helps in reducing the wastage of paper used for marking the attendance by storing all the data in computer memory. The rise in awareness about the virus spread make us take all the precautions and safety regarding the coronavirus, where temperature sensor helps us to tell the current body temperature. Hence we have used face recognition concept to mark the attendance of student and make the system better.

Future scope

In future this system need be improved because these system sometimes fails to recognize students from some distance, also we have some processing limitation, working with a system of high processing may result even better performance of this system. Project can be updated in near future as and when requirement for the same arises, as it is very flexible in terms of expansion.

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Acknowledgement

Success of a project like this involving high technical expertise, patience and massive support of guides, is possible when team members work to-gather. We take this opportunity to express our gratitude to those who have been instrumental in the successful completion of this project. We would like to appreciate the constant interest and support of our mentor **Mrs. Nupur Gaikwad** in our project and aiding us in developing a flair for the field of Your Domain. We would always cherish the journey of transforming the idea of our project into reality. We would like to show our appreciation to **Mrs. Nupur Gaikwad** for his/her tremendous support and help, without whom this project would have reached nowhere. We would also like to thank our project coordinator **Mrs. Dakshayani R** for providing us with regular inputs about documentation and project timeline. A big thanks to our HOD **Dr. Lata Ragha** for all the encouragement given to our team. We would also like to thank our principal, **Dr. S. M. Khot**, and our college, **Fr. C. Ro-drigues Institute of Technology, Vashi**, for giving us the opportunity and the environment to learn and grow.

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Appendix A: Timeline Chart