

Attendance Marking Approach

- > I have used open cv library in python to detect the faces of the students and to mark their attendance in a text file named "attendance".
- > Open cv has a library which is known as face recognition which is used to recognise the face of the student.
- > First we need to feed the face of the student to the programme.
- > After that face collects 128 parameters related to the face which is given to it. It is called encoding.
- > Encoding is done for all the faces given to the programme.
- > After that it makes a list of all the encodings of the face.
- > Then video is made on.
- > Open cv searches for the face in the frame of the video.
- > After getting the face, it also does the encoding for the face in the frame.
- > After that it compares the encodings of the face in the frame with the encodings in the list which was made before.
- > If the encodings of the face in frame matches with any one of the encodings in the list, then the system speaks out the name of the person it identifies and then marks the attendance.

Automative Operation of Smart Light and Fans

- > I will be controlling light and fans using the Arduino Uno development board
- > With the help of relay module I can control them
- > I have used PIR sensors and Ultrasonic distance sensor to check the presence of students and teachers in the class and control the lights and fans according to it.
- > There will be two conditions to satisfy simultaneously which will decide whether the fans and lights will remain on or off.
- > Ultrasonic sensor will be installed at any one wall of the classroom so that there should not be any window opposite to the sensor otherwise the readings may differ.
- > When there is no one in the classroom, then the distance measured by the ultrasonic sensor will be equal to the distance between the two opposite walls.
- > But if there is someone in the classroom then distance measured by sensor will be less than the length of the two walls which shows the presence of students or teachers.
- > PIR sensors will also be installed to track any movement of a living being in the class.
- > If PIR sensor does not sense any motion and ultrasonic sensor reads the value equal to the distance between two walls, it will mean there is no one in the class and all the appliances will be off.

Novel Ideas

- > In round 1 I have used PIR sensors and Ultrasonic distance sensor to detect the presence of students or teachers in the classroom.
- > We can also add microphones(Sound sensors) to detect the presence of someone by adjusting it to a certain threshold with the help of potentiometer in it.
- > Instead of using camera just for attendance,we can also use it to identify whether there is anyone in the classroom or not.The face recognition library will help us to do so.
- > Instead of controlling lights and fans with the help of single development board,we can also control the entrance system of class with the help of servo motors so that we can also avoid the risk of proxies instead of just taking attendance.
- > Here in the round 1 I have only updated the attendance in the python file but we can also update the names of the students on the google sheet or send a notification to their parents through telegram,sms etc.
- >Instead of using the cam of the laptop I can also use raspberry pi cam or esp32 cam.