

Classroom Automation by Using Raspberry Pi

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Abstract – Presently automation using IOT has become the measure attraction and is thriving everywhere, here we are trying to control the home appliances and entertainment system using the internet and google assistant. The main peep of our project along with automation is the usage of google assistant, where we are including the technology into the simple voice mechanism. The heart of our project is raspberry pi 4B. Smart Classroom using raspberry pi is a very simple and effective user interface. It eases the user to control the device effortlessly and successfully. The project will reach most of the people's expectations as it is controlled only via face where we don't even have to touch it, and coming to the classroom automation it is everyone's favorite. we found designing and developing this interactive project a very interesting and good learning experience

1. INTRODUCTION

Attendance for the students is an important task in class. When done manually it generally wastes a lot of time. Market-like biometric attendance. This proposed solution for the current problem is through automation of attendance. A system using face recognition Face is the primary identification for any human. This project describes the method of Detecting and recognizing the face in real time.

Raspberry Pi 4 Model B is used for computation in the detection and Recognition modules. This project describes an efficient algorithm using an open-source image processing framework. This project can be used for many other applications where face recognition can be used for authentication Raspberry Pi. We implement our project by using features like QR codes, Face recognition, etc.

The main motivation of the work is to develop a system which can be implemented anywhere, it may be a classroom or in an auditorium. The system is a low-cost module and mobile which can be implemented everywhere. It should replace the conventional method of calling out names or signing papers, which takes a lot of time. The system should be reliable. We were motivated to develop a system by combining the power of deep learning and raspberry pi to help society and something which can be implemented in the near future instead of providing a proof of concept.

In the current education system, the information and the details are to be entered manually and it is tiring and at the same time needs a lot of concentration and attention while inserting the values.

2. LITERATURE REVIEW

1.S. Rajkumar al. /International Journal of Pharmacy & Technology In this paper, Face Recognition-based Lecture Attendance System, the system marks attendance using face recognition by taking pictures of the whole class. It will be difficult to estimate the attendance accurately using individual results of the face recognition system as the face detection rate is usually low.

2, Paras Jain UG Student, Computer Science Department, Arya Institute of Engineering & Technology, Jaipur, Rajasthan, India

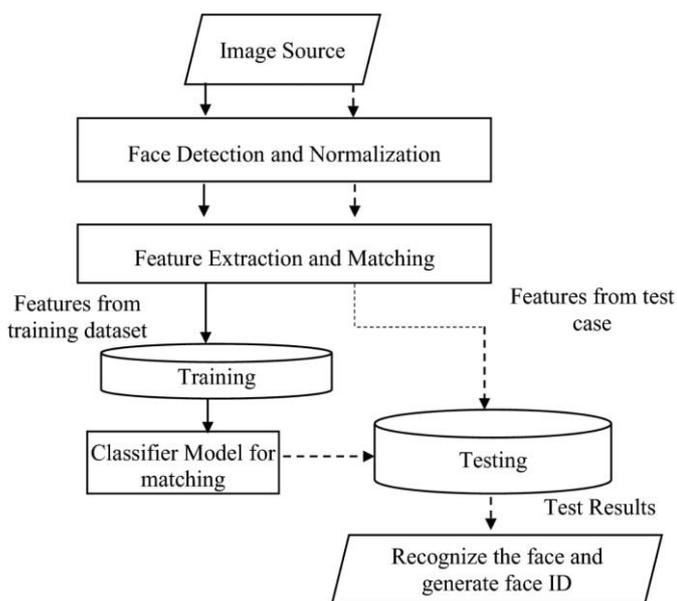
3. A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques: In this paper, the idea of two technologies namely Student Attendance and Feedback system has been implemented with a machine learning approach. This system automatically detects the performance and maintains the student's records like attendance and their feedback on the subjects like Science, English, etc. Therefore, the attendance of the student can be made available by recognizing the face-recognizing, attendance details and detail about the marks of the student is obtained as feedback.

4. Automated Attendance System Using Face Recognition: Automated Attendance System using Face Recognition proposes that the system is based on face detection and recognition algorithms, which are used to automatically detects the student's face when he/she enters the class and the system is capable to marks the attendance by recognizing him. Viola-Jones Algorithm has been used for face detection which detects human faces using cascade classifier, PCA algorithm for feature selection, and SVM for classification. When it is compared to traditional attendance marking this system saves time and also helps to monitor the students.

3. SYSTEM DESIGN

A) By using face Reorganization:

An automated Attendance System using Face Recognition proposes that the system is based on face detection and recognition algorithms, which are used to automatically detect the student's face when he/she enters the class and the system can mark the attendance by recognizing him. Viola-Jones Algorithm has been used for face detection which detects human faces using cascade classifier, PCA algorithm for feature selection, and SVM for classification. When it is compared to traditional attendance marking this system saves time and also helps to monitor the students.

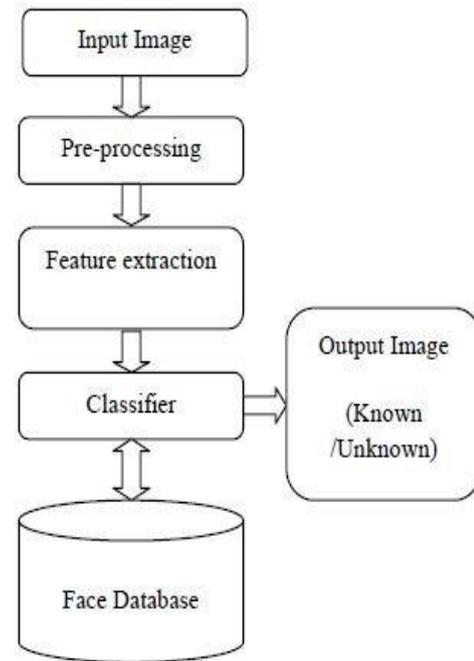


B) By Using a QR Code

This application is named Attendance Monitoring System Teaching with QR Code and Geo Location using the Android Platform. This application aims to make it easier for officers and school authorities to control, supervise, and recapitulate teacher attendance. This application consists of several users including teachers, admin staff, administrators, and students. The data needed for this application: teacher data, student data, class data, schedule setting data, teacher schedule data, class data, and teacher attendance reports

Advantages of QR Code-Based Smart Attendance System:

1. Provide better Security.
2. Maintenance of the system is easy and cost-effective.
3. Generate the result quickly.
4. Provide accurate and efficient data.
5. User-friendly.



4. OBJECTIVE OF THE PROJECT

We will design a system based on raspberry pi through which we will be able to:

1. Record the attendance of the students
 - a. Through face recognition and/or
 - b. QR code
2. Control the room's electric appliances
3. Remotely monitor attendance through a centralized location
4. The objective of the attendance software is to reduce the time that is consumed when attendance is taken manually. Unlike the manual process, an online system

easily helps management to analyze students' attendance details as per requirement.

5. An accurate report based on student attendance is generated here. This system will also help in evaluating the attendance eligibility criteria of a student

5. SCOPE OF THE PROJECT

To store, access, and manage student attendance data for every lecture and lab class. All the student attendance data will be stored and managed through Student Attendance Management System.

The scope of the project is the system on which the software is installed, i.e., the project is developed as a desktop application, and it will work for a particular institute. But later on, the project can be modified to operate online.

In the future, we will also add other features like a fingerprint sensor, eye retina scanner, etc.

At the end of the semester calculation of attendance is done and if the student has less than 75% attendance in a class, a message will be sent to the HOD, class teacher.

6. CONCLUSIONS

With advances in digital technology, the quality of facial verification in face recognition attendance systems has improved, and the acceptance rate is relatively high. Face recognition attendance systems' appeal is enhanced further by their fast image processing time and ease of integration. The facial recognition attendance app improves employee attendance tracking while cutting costs. A system like this also provides an additional layer of protection to the workplace. If your company is still using a manual or fingerprint biometric attendance system, it's time to switch to a facial recognition attendance system. Face recognition attendance systems can thus be proven to be secure and efficient. In real-time scenarios, the Haar Cascade Classifiers outperform other algorithms and are found to be suitable for the implementation of this work. It gives a better recognition rate with a low false rate. Using Raspberry Pi independently improves the mobility of the work and it acts as a standalone hardware. The work can be further developed by improving the recognition rate and by using the Raspberry Pi Infra Red camera module this system can be used as a security surveillance system.

4. REFERENCE

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