Fingerprint, Face and Voice Based Smart Attendance System Using IoT

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ABSTRACT

Article Info

The goal of this project is to record attendance automatically using biometric and recognition. In the domain of technology that evolves and alters daily, use of biometrics is the most popular and trending technology. If you think about it over the long term, manually taking attendance for a class of roughly 60–80 kids can be a time-consuming operation. Each person has a unique biometric trait such as fingerprint, face structure, voice detection etc. Biometrics, Fingerprint, Face Structure, Voice Detection. Given that they produce superior recognition results and so increase security when compared to biometrics based on a single modality, multimodal biometric techniques are becoming more and more important for personal verification and identification. In this work, we present a multimodal biometric system that combines fingerprint, voice, and face features.

Keywords: Fingerprint Sensor, Raspberry pi, Camera Module

I. INTRODUCTION

In the developing world of technology and people. Many organizations, institutions, and companies are wasting a lot of time and effort in marking the attendance of every individual daily. This Project will help them for the suitable, accessible, reliable, efficient, and affordable attendance system which will cut the effort and time for them. The most useful and reliable technology for large no. of employee's or students is the biometric technology that uses the fingerprint, Image Recognition verification of an individual by analyzing the human finger characteristics that are widely used in various aspects of life for many purposes, most significantly in the study the issue of staff attendance.

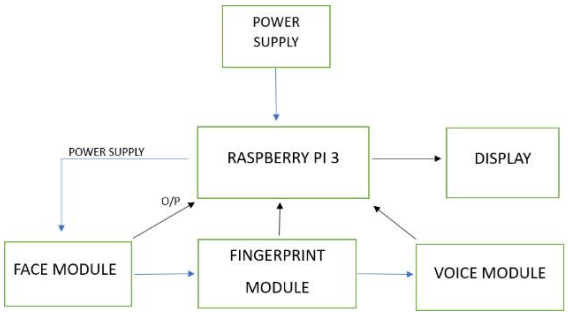
We are adding voice Recognition System into it and it will make the system more accurate capturing the biometrics from Face Structure and Fingerprint. Manual attendance has been carried out for many years which is time consuming and provides erroneous results. The school is required to keep an attendance log on paper and in registers. With the development in technology, we must look for an automated way for managing attendance.

There are numerous advantages to voice recognition technology being developed for student attendance systems. The administration can effectively track student attendance with its assistance. Teacher together with this project, voice biometric is employed as a means for student to indicate their attendance. Student need to speak their own name five time for store the voice data then three time to sign their attendance. This is because system need to have identity of the students to do voice wave pattern matching.

II. METHODOLOGY

We are using the fingerprint, face, and voice biometrics of every individual person to record and store the collection of information database that will be used to detect the person coming on entry and giving the algorithm will match the data that is stored in the cloud database If the data is matched with the individual who is that actual person, it will also be compared to see if there are any discrepancies whose trying to make an entry if it matches with the persons who are that actual person whose trying to make an entry.

III. SYSTEM ARCHITECTURE



Block diagram of System

IV. LITERATURE REVIEW

1. A Wireless Fingerprint Attendance System.

In this paper we design a system which takes student attendance and the attendance records are maintained automatically in an academic institute. Taking the attendance manually and maintaining its record till end of year (or even beyond) is very difficult job as well as wastage of time and paper. This necessitates an efficient system that would be fully automatic.

2. Automated Attendance System and Voice Assistance using Face Recognition.

In this work we propose a Live Attendance Marking System for institutional purpose. This system will enable the department to mark the attendance of students automatically by recognizing their faces. The system is based on the face detection and recognition algorithms and automatically recognizes a student whenever he/she comes across the camera module.

3. A Review of the Fingerprint, Speaker Recognition, Face Recognition, and Iris Recognition Based Biometric Identification Technologies

This paper reviews four biometric identification technologies (fingerprint, speaker recognition, face recognition and iris recognition). It discusses the mode of operation of each of the technologies and highlights their advantages and disadvantages.

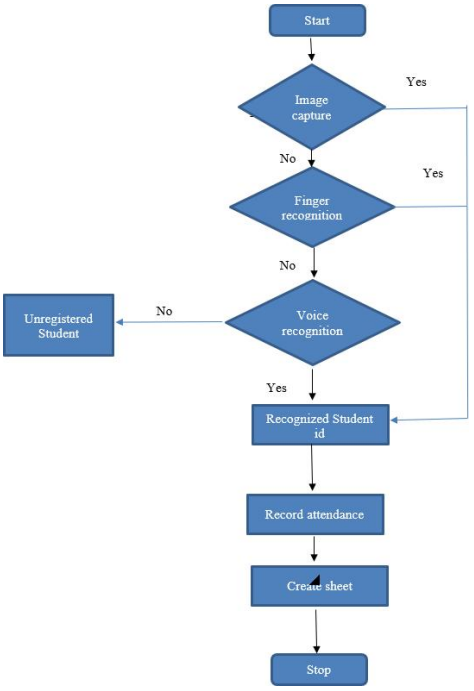
4. Multiple Door Opening/Closing Detection System Using Infrasound Sensor

Our research group is currently focused on research and development of Internet of Things-based robust emergency and disaster prevention systems to transmit tsunami information retrieved from infrasound sensors. To constantly test the effective sensor operation, it is necessary to generate infrasound. Therefore, we considered the infrasound generated when opening and closing doors in this study, and used one sensor to detect the state variation of multiple doors. We constructed and verified the detection system for various doors.

5. Wireless Door Access System with Face Verification

A traditional door access system using a keycard uses wired cables from many door units to the backend server for authentication. The system install- lotion is thus time consuming and costly in a large floor area with many rooms. Besides, the hardware and software in the system are proprietary to each company offering the product. In this work, we design and implement a wireless door access system where the door units communicate with the backend server over a wireless network. To achieve better security and performance, the authentication is based on both a student/employee ID card and an image snapshot for face verification.

V. FLOW CHART



VI. HARDWARE USED

Raspberry Pi:

The Raspberry Pi 3 is a credit card-sized minicomputer that can communicate with any input and output

Fingerprint Sensor:

The students fingerprints are used by biometric technologies to confirm their identity as they clock in and out. The student's fingerprint is scanned, its endpoints and intersections are compared to a record in the database, and access is then provided as a result.

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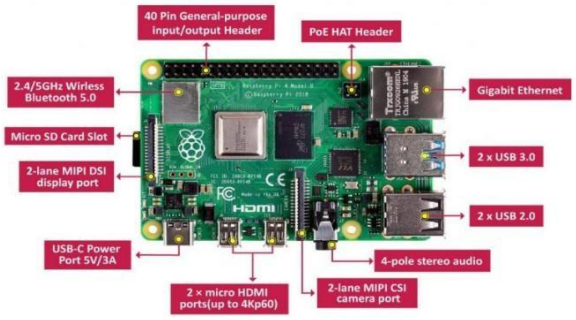
Mic:

A sound sensor acts like a microphone that detects sound signals a provide digital or analogy output. The microphone is used to take the audio samples of the students and employees.

hardware, such as a monitor, a television, a mouse, or a keyboard, turning the setup into a fully functional PC at a reasonable price.



A webcam's function is to capture or transmit

video to a computer or computer network. A typical digital video component found in computers is a webcam. Its major function is to send photographs over the Internet. It is frequently used for image recording and with instant messaging services.

VII. WORKING

In this project we have made a device which can easily take your attendance by three methods which are face, voice, and fingerprint. It includes hardware like Raspberry pi3, Camera Module with in build microphone, Fingerprint Sensor. Working of the project can be stated as,

1. We must save fingerprint, voice, and face data of individuals in the system.
2. After saving the data we must train the images of face to get the accurate result.
3. When student try to mark attendance through face recognition if there is any issue with face then it goes to the fingerprint recognition.
4. If there is also problem with face and fingerprint then it tries with voice sample of student saved in the system.
5. At last, when any one of it get successful then it marks attendance and create Excel sheet.

Camera Module:

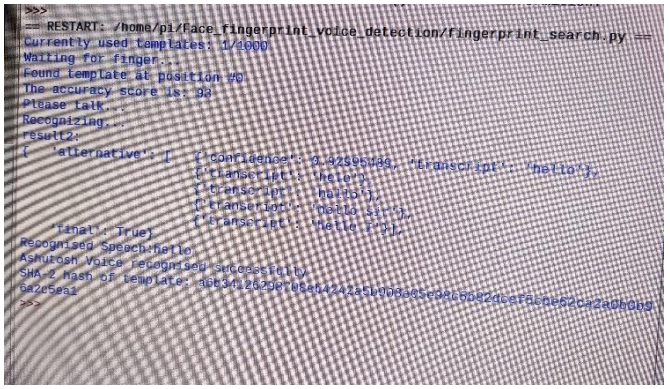
VIII. FUTURE SCOPE

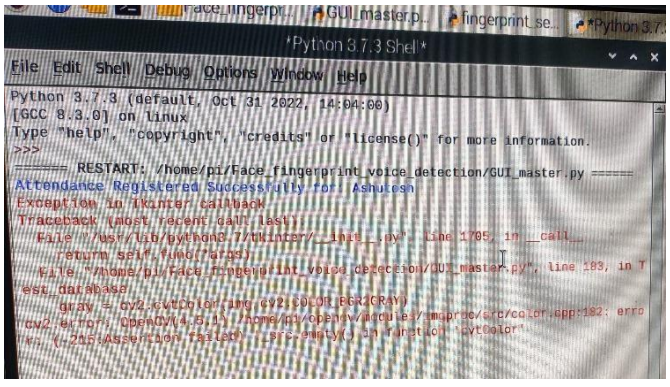
1. For future study, it may be possible to collect attendance using simply a smartphone rather than putting together a system with various hardware components.

2. Using a wireless connection on the Smartphone, the biometric features can be captured and the data uploaded to the cloud server for authentication.

3. The cloud database can store these attendance records. However, in an era of growing mobile connectivity, researchers must take precautions to ensure the security and privacy of biometric data to avoid becoming targets of cybercriminals.

IX. RESULTS





X. CONCLUSION

For tracking attendance in real-time, this approach works well. Different kinds of database storage can be used to store attendance information. While conventional memory cards can only store data locally to a limited level, the server is appropriate for large capacity storage and ease of access. Additionally, the number of pupils and size of biometric template decide the forms of storage database as well. Finally, additional elements are required to complete the entire biometric attendance system. Researchers may decide to use a more potent microcontroller, contactless sensor, greater database storage, and a communication connection with a high data rate in a big classroom. In conclusion, the benchmark for selecting hardware products or components always focuses on three key factors: cost, power consumption, and speed. Additionally, the ubiquitous usage of mobile devices in the internet of things (IoT) era advances biometric-based attendance systems.

XI. REFERENCES

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