

IoT BASED ATTENDANCE MONITORING SYSTEM USING FACE AND FINGERPRINT

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Abstract - Authentication is one of the vital concern in this era of information system. Inclusive of the other techniques, Human Face Recognition (HFR) is one of the techniques which is used for user authentication. HFR has been extensively used in many appliances as in, video conferencing, military services and attendance systems. Maintaining attendance is difficult process if it is done manually. The automated attendance system for administrating the attendance can be put into effect using the several ways of biometrics. Usage of this system can resolve the issue of fake attendance and proxies. Instead of recording the attendance in writing, taking attendance through fingerprint and face recognition will make it a hassle free process.

Key Words: Internet of Things technology (IOT), Raspberry Pi

1. INTRODUCTION

Biometrics is an evolving technology used for identification. Biometrics is associated with automatic identification of a human being depending upon biological factors as in fingerprint, iris, facial recognition. In our project biometric fingerprint and face recognition attendance system is proposed but, with a twist. Instead of using GSM, ZIGBEE, RFID, we are making this setup IOT based to overcome the consequences of the above. This would improve the accuracy of the records, approve proper paid days and leave days of the staff and this shall all be monitored by a superior authority because it will remove all the hassles of the staff rushing for their attendance consideration on register and then the difficulties in payment making of the staff due to improper attendance consideration. Every professional organization has to maintain a proper record for effective functioning of the organization. Presenting a better attendance system for departmental staff so that the records can be analyzed and handled with ease and accuracy was a vital key behind motivating this project. The result of the data collected through this system will be stored on web server.

2. LITERATURE REVIEW

1. Speech Biometric Based Attendance System by Subhadeep Dey, Sujit Barman, Ramesh K. Bhukya, Rohan K. Das, Haris B C, S. R. M. Prasanna and R. Sinha.

In this paper we learnt about the development and implementation of a speech biometric based attendance

system. The users access the system by making a call from few pre decided mobile phones. An interactive voice response (IVR) system guides a new user in the enrollment and an enrolled user in the verification processes. The system uses text independent speaker verification with MFCC features and i-vector based speaker modeling for authenticating the user. Linear discriminant analysis and within class covariance normalization are used for normalizing the effects due to session/environment variations. A simple cosine distance scoring along with score normalization is used as the classifier and a fixed threshold is used for making the decision. The developed system has been used by a group of 110 students for about two months on a regular basis. The system performance in terms of recognition rate is found to be 94.2 % and the average response time of the system for a test data of duration 50 seconds is noted to be 26 seconds.

2. Student Attendance System in Classroom Using Face Recognition Technique by Samuel Lukas, Aditya Rama Mitra, Ririn Ikana Desanti, Dion Krisnadi.

This paper proposes a method for student attendance system in classroom using face recognition technique by combining Discrete Wavelet Transforms (DWT) and Discrete Cosine Transform (DCT) to extract the features of student's face which is followed by applying Radial Basis Function (RBF) for classifying the facial objects. From the experiments which is conducted by involving 16 students situated in classroom setting, it results in 121 out of 148 successful faces recognition.

3. Wireless Fingerprint Attendance Management System by Penta Anil Kumar, Maddu Kamaraju.

This paper presents the design methodology of a simple and high real time Zigbee - biometric system for easy and time saving attendance management using the finger prints of the employees at any organization along with the employee incoming and outgoing log maintenance. Firstly employee's fingerprints are scanned by software and an identity number is allotted as their enrollment. During the attendance time when employees impress their fingerprints, against the scanner, the system compares the new fingerprint patterns and the connection between various points in the fingerprint with the enrollment database. A match is recorded as a knock exercising acquisition, processing, transmission, matching. Through this automatic system, time and manpower is reduced to the great extent.

3. PROBLEM STATEMENT

1. To design and develop attendance monitoring system using face and fingerprint.

4. METHODOLOGY

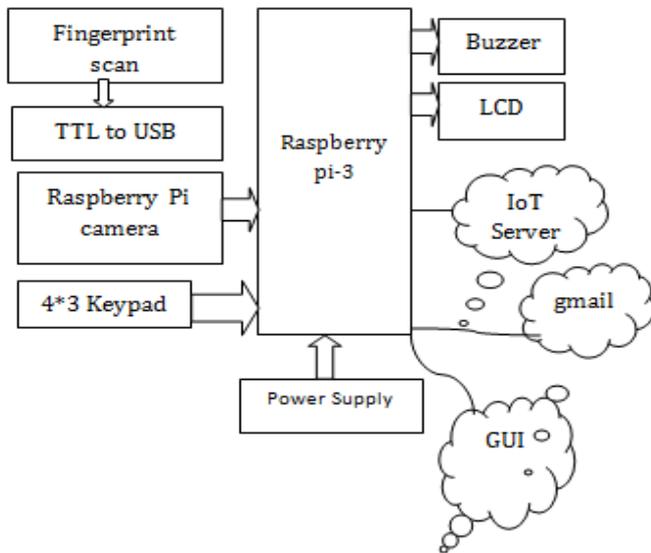


Fig-1: Block Diagram

The Components included in our proposed system are

1. Raspberry pi 3
2. Fingerprint scanner
3. Web camera
4. Keypad 4*3
5. LCD 16*2
6. Buzzer

5. DESIGN OF ATTENDANCE SYSTEM

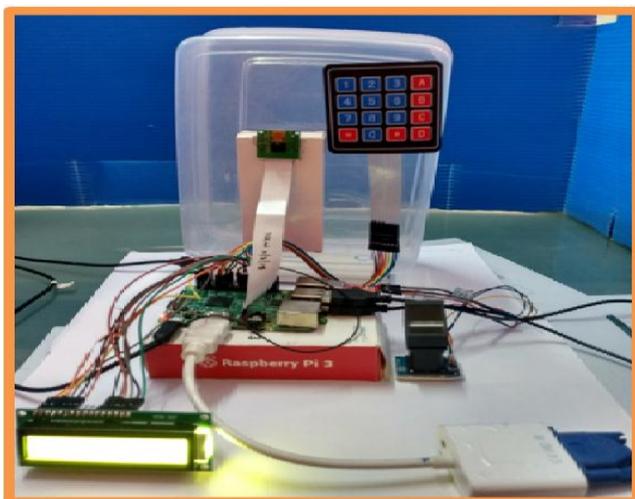


Fig-2: Hardware Of System

6. REQUIRED SOFTWARES AND HARDWARE

6.1 SPECIFICATION OF RASPBERRY PI

1. CPU is Quad-core 64-bit ARM Cortex A53 which is clocked at 1.2 GHz.
2. GPU is 400 MHz Video Core IV multimedia.
3. Memory available is 1GB LPDDR2-900 SDRAM.
4. There are 4 USB ports.
5. Video outputs are HDMI, composite via 3.5mm jack.
6. Network available is 10/100Mbps Ethernet and 802.11n Wireless LAN.
7. There are 17 GPIO plus specific functions and HAT ID bus in peripherals.
8. Consist of Bluetooth 4.1
9. Power source provided is 5V via MicroUSB or GPIO header.
10. Size of the board is 85.60mm*56.5mm.
11. Weight of the board is 45gm.

6.2 The software and hardware required to run this project are:

1)Raspberry Pi 2) Python IDLE2

1) Raspberry Pi:- The Raspberry Pi is a minimal cost, small credit-card sized computer that plugs into a monitor or TV and uses external keyboard and mouse for functioning. It is a useful device that permits people of all generations to explore programming languages like Scratch and Python. The Broadcom BCM2835 which is used in primary generation Raspberry Pi is similar to chips that are used in the first generation of modern smartphone whose CPU is an older architecture of ARM versions 6. This architecture includes processor of 700MHz ARM 11 76JZF-S, graphics processing unit that is VideoCore IV and RAM.



2) Python IDLE2: IDLE which stands for integrated development environment or integrated development environment is a platform for python which is filled with

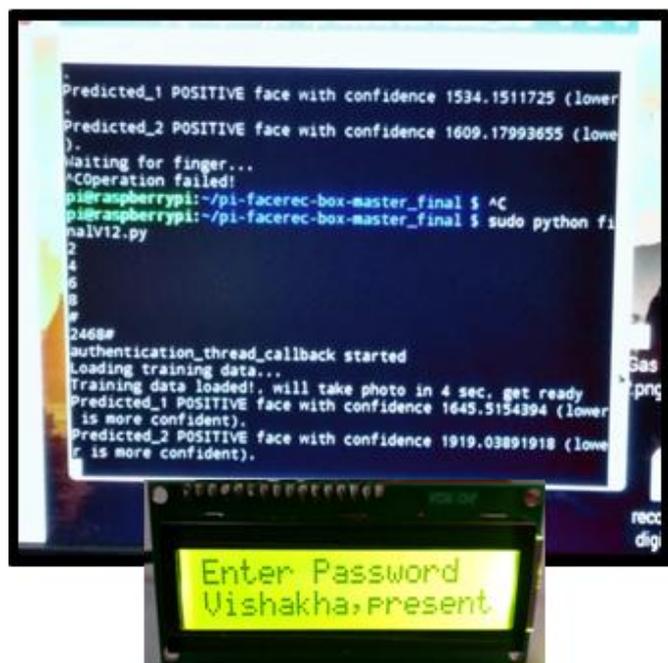
default implementation of language. It is packed as a part of python language with many distributions of linux. It is written completely in Tkinter GUI tool kit and python. The main features of IDLE are that it has syntax highlighting with multi window text editor, smart indent, auto completion. It has call stack visibility, persistent breakpoints, stepping with integrated debugger. IDLE has been looked down upon for various issues including focus losing, unavailability of copying to clipboard features and absence of line numbering options and user interface design. It is also called as disposable IDE because user constantly shift to advance version of IDE as they gain experience.

7. WORKING:

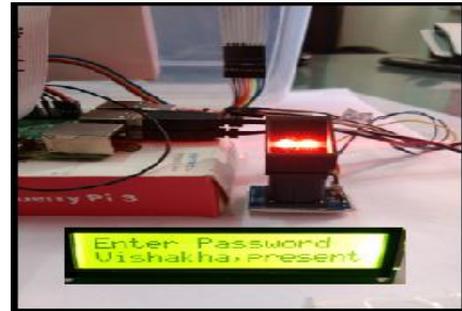
In our project first of all the user will enroll the fingerprint sample and face sample into the system. After this there will be insertion of system password that is for example "2468". Then user should get ready, as the camera will now capture your image. Now if the image detected matches with the trained image in the database, the attendance will be marked "PRESENT" on the LCD. Two face recognition attempts have been provided. But if the camera fails to recognize the face then, the fingerprint scanner will be activated and the attendance will be marked "PRESENT". Now the user must get ready for fingerprint recognition. The attendance will now be sent to the "Things Speak" server which can be viewed on any desktop. Information on the user interface will be provided in tabular format which will include fields like date, name, in-time. This is the working of the block diagram.

8. TESTING

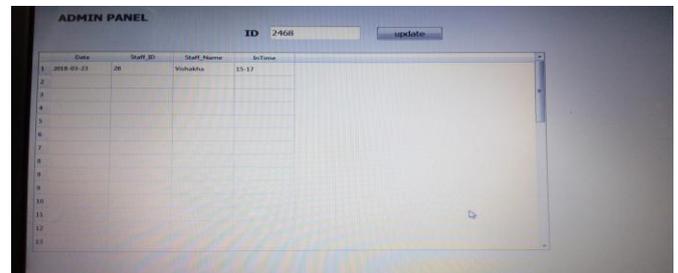
8.1 Password entered manually, Face recognized and attendance marked.



8.2 Fingerprint Recognized and attendance marked.



8.3 The attendance will now be sent to the "Things Speak" server which can be viewed on any desktop. Information on the user interface will be provided in tabular format which will include fields like date, name, in-time.



9. CONCLUSION

With the use of this application, we can fairly conclude that:

It will help the authorities of the educational institution to maintain the security and integrity of its vital data like staff attendance, students attendance, examination marks etc. As the data shall immediately be transmitted over IOT server wirelessly the authorities need not have to worry about the misplacement or misuse of attendance registers or examination registers, etc. Thus project is the user friendly approach.

10. REFERENCES

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