Students Attendance and Classroom Automation system Using IoT

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1.ABSTRACT

This project deals with face detection for an attendance recorder system for the purpose of maintaining attendance details of the students. Students faces are pre stored in class databases. Raspberry pi camera capture the student face and compared to database image if it is matched means that student attendance register with time. In recent days the automatic intelligence system becomes very popular for smart tasks execution and easy maintenance and handling of data with the use of advanced processors. To avoid time losses, we are about use automatic process which is based on image processing. In this novel approach, we are using face detection & face recognition system. This face detection differentiates faces from non-faces and is therefore essential for accurate attendance. The other strategy involves face recognition for marking the student's attendance. The Raspberry pi module is used for face detection & recognition.

Keyword: *Raspberry Pi 3 Model B, 360^0 Camera with USB, PIR sensor, Open CV, PHP, MySQL, Image Processing.*

2. INTRODUCTION

India is the one of the developing country in the world and Indian engineers and scientist doing extremely well in technology field. The classrooms have become digital but managing attendance of students still it is headache for teachers to manage their catalogs and paper work, so aimed our project that is student attendance system using face reorganization and classroom automation using IoT. IoT is a technology which has accepted whole world. By using IoT we are sending recognized face to the website using Raspberry and Camera. Raspberry Pi 3 is a device which is very small size but very effective for IoT application development. It has a 64 bit 1.2 GHz quad core ARMv8 processor. Here in our system we have used 360^0 rotational camera. Classroom automation is the use of information and control system technologies to reduce the need for human work in the institutes. This has been done with PIR sensor. With this PIR sensor interfaced with Raspberry Pi 3 to control the number of appliances in classroom like light, fan, speakers and many more using relays. Also rotational camera help us to detect/recognized face and send live streaming to the website and we can give authority to access that live streaming also give authority to different users like students to attend the lecture when student is absent OR principle to monitor the class and teachers activity.
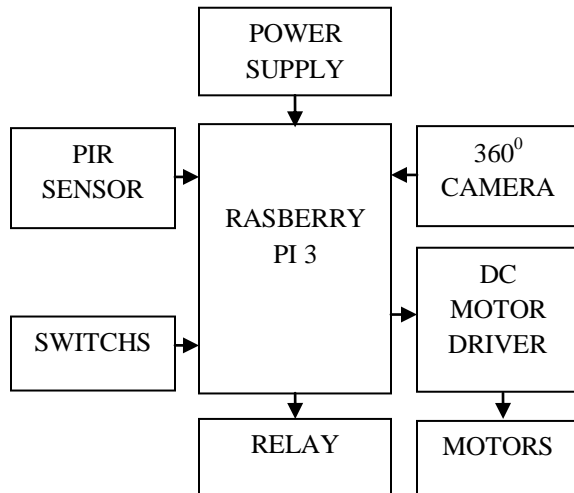
3. BLOCK DIAGRAM

Fig.1- Architecture of the proposed system

4. FLOWCHART

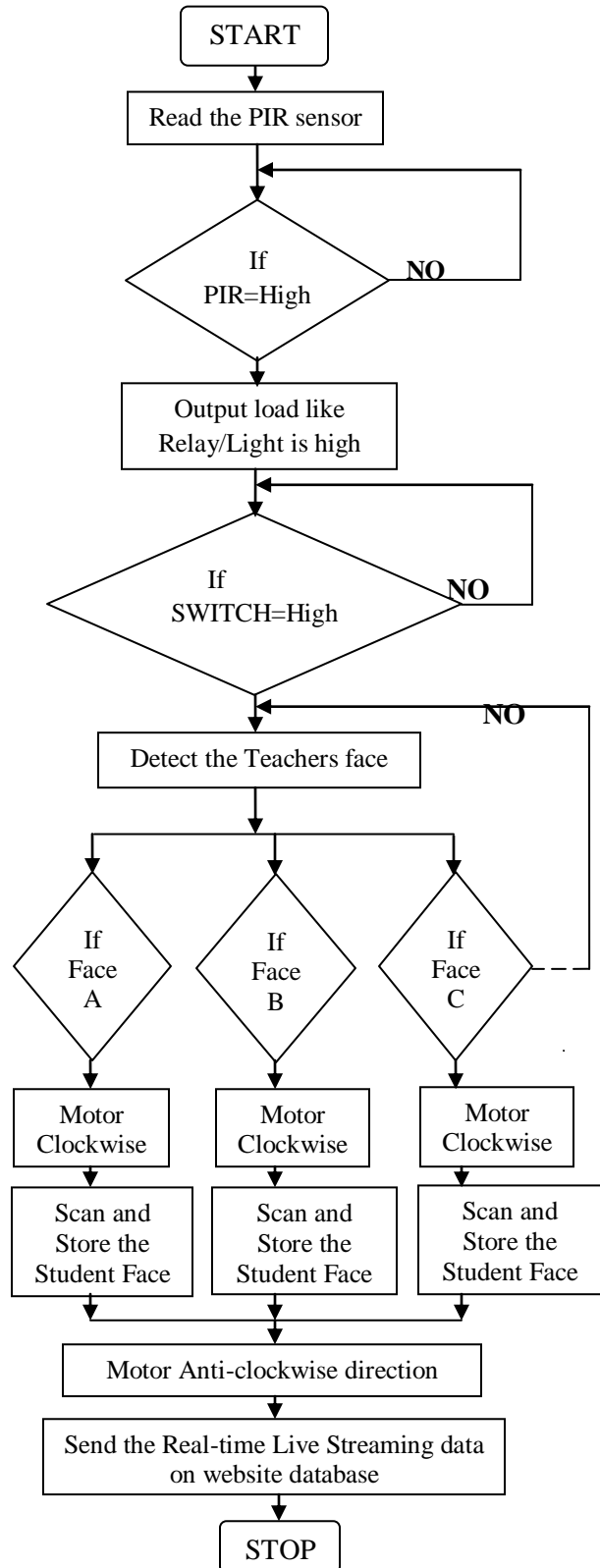**Fig. 2 Flowchart of Proposed System**

5. RASPBERRY PI 3 MODEL B

Fig.2- Raspberry Pi 3 Model B

Raspberry Pi 3 Model B is a main control board, which will do the majority of operations[10]. It has Micro USB 5V power input[1-2]. Upgraded switched power source that can handle up to 2.5Amps. Raspberry Pi 3 packs 1.2 GHz BCM 2837 ARMv8 64 bit quad core processor, 1 GB RAM, it support 4 USB devices, HDMI support and microSD card[1-2]. The camera module is sends the images to it. A Wi-Fi router is used for communication between data transmission and receiving. 40 pin GPIO enables multiple sensors, connectors and expansion boards to be added. DC motors are attached to the camera and are controlled through the GPIO pins of Raspberry Pi 3 via Wi-Fi network[10]. Classroom automated lightning system using MicroSD card slot of Raspberry pi 3, it is a flexible system which is reduces electricity bills[8]. Face recognition based automatic attendance management system using website database design, it store the data of a set of facial patterns for each individual student[9]. We proposed a system to build a real-time live streaming and monitoring system using Raspberry Pi 3 with installed Wi-Fi connectivity[10]. In monitoring phase, the pi will record the video of the location of real-time[10]. This capturing video is done through commands given through the computer to the Raspberry Pi 3[10]. The live streaming is accomplished by using camera with Pi and it is controlled through webpage created[10]. As IP based installation provide to access live data from anywhere in world via Wi-Fi OR networking.

6. PIR SENSOR

In proposed system we have user RE200B PIR sensor. PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in OR out of the senses range[3]. PIR designed to pick up heat radiation of wavelengths in a band around 10m. The result in good compensation of environmental temperature and excellent sensitivity for small changes spatial temperature[3].

7. DC MOTOR DRIVER

L293D is a dual H bridge motor driver IC. Motor driver acts as current amplifiers as they take a low current control signal and provide high current signal[10]. L293D contains two inbuilt H bridge driver circuits used to drive the motors. The DC motors can driven simultaneously i. e. both clockwise and anti-clockwise direction in its common mode of operation[10]. The motors are controlled by input logics 2 & 7 and 10 & 15 pins. Enable pins must be high for motors to start the operating.

8. MOTORS

Motors are required for rotating and motion of camera. The motors are interfaced to Pi through drivers because the output port of Pi cannot source the required amount of current[10]. In this proposed system the camera movement is controlled through directions mentioned in the PHP code.

9. 360^0 USB CAMERA

In this system we have use 20MP, 5V USB camera with microphone. Software is available to allow PC connected cameras to watch movement and sound, recording both when they are detected[6-7]. These recordings are then saved to the created website database[5-6]. When video stream captured by the cameras, the video stream may be saved, viewed or sent on to other networks via system such as internet and emailed as an attachment[5-6]. It may also be used in its original sense of a video camera connected to the web continuously for an indefinite time, rather than the particular session, generally supplying a view for anyone who visits to its website[5].

10. RELAY

In this proposed system for classroom automation, we have use a relay to controlling the load such as light, fan etc. A relay is an electrically operated switch. A type of relay that can handle high power required to directly control any type loads[4]. They repeated the signal coming in from one circuit and re-transmitted it on another circuit[4].

11. SWITCH

In this proposed system we have use normal push button switch. This type of switch is also known as normally open. In system we are use this type of switch for controlling to mentioned cameras operation i. e. face reorganization and movement of camera. Also in case of security we will implement keypad OR fingerprint module by the instead of normal switch.

12.CONCLUSION

This paper introduces the efficient and accurate method of attendance in the classroom environment that can replace the old manual method. This method is secure enough, reliable and available for installing the system in the classroom. It can be constructed using a camera and computer. The proposal is an extension for the Lecture Delivery System based on setup of Raspberry Pi with its camera module. But this proposal is far from being perfect and there is lot of room of improvement as the field of IoT is improvising day by day, we can expect much more features added in the current proposed system.

13. REFERANCES

[1] Raspberry Pi 3 Model B https://www.raspberry.org/products/raspberry-pi-3-model-b/

 [2] Raspberry Pi 3 Model B- https://www.rs-component.com/raspberrypi

[3] https://www.pirsensor.com/wikipedia/

[4] https://www.relay.com/wikipedia/

[5] https://www.usbwebcamera.com/wikipedia/

[6] Knowing Raspberry Pi Camera https://www.raspberrypi.org/products/camra-module/

[7] Raspberry Pi Camera and its operation https://github.com/iizukanao/picam

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[8] International Journal of Innovative Research in Science, Engineering and Technology, Vol. 4, Issue 7, July 2015.

[9] IOSR Journal of Computer Engineering, Volume 19, Issue 2, Ver. IV (Mar.-Apr. 2017), www.iosrjournal.org.

[10]   International Journal of Science, Engineering and Technology Research (IJSETR) Volume 5, Issue 8, August 2016.