

VOICE RECOGNITION BASED HOME AUTOMATION USING IOT

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Abstract: Home automation is a modern technology that modifies our home to perform different sets of tasks automatically. It guarantees security, surveillance, automation of devices for the user to make their life more comfortable. In the proposed method, voice recognition and web app are used to control the functioning of electrical appliances like fans and lights. A small-scale prototype is also implemented for intrusion detection and web app using Raspberry pi. This method is integrated with a wireless home automation system and it sends email alerts to the respective user. Face recognition is done for the security features for the purpose of identifying the unauthorized person.

Keywords: Internet of things, Raspberry pi, Voice recognition, Web app.

I. INTRODUCTION

In communication systems, especially home automation is playing an important role in daily life. This system is based on Python, Raspberry pi, web application and is neither user predicted nor condition controlled. The appliances are controlled by Raspberry Pi. It is connected with a microphone, relays, camera, and sensors that monitor the state of electronic devices. A door monitoring system is designed based on recognition from a camera and face detection, where the camera is installed outside the main door. The interesting feature is that the appliances can also be controlled over voice recognition. The recorded voice is converted into text in which would be processed by Raspberry Pi. In the home section, various sensors are placed to sense the home environment, and the fan and light are automatically controlled over sensors. The user can monitor the home and control the home appliances either by the web application or by voice recognition. a web server is used in home appliances to remotely access and controls the devices.

II. PROPOSED SYSTEM

Now a day's Home automation system plays a significant role. In this method, a prototype is designed to monitor and control the home appliances and security over the web application and also through voice recognition. The home automation system was developed by the following steps as shown below.

Home automation is a modern technology that modifies our home to perform different sets of tasks automatically. It guarantees security, surveillance, automation of devices for the user to make their life more comfortable. In the proposed method, voice recognition is taken as input to control the functioning of the electrical appliances like fan and light, also a web application is developed to control the appliances from remote areas by using natural language. This detection system is integrated with a wireless home automation system and it sends email alerts to the respective user. Face recognition is also done for the security purpose of identifying the unauthorized person.

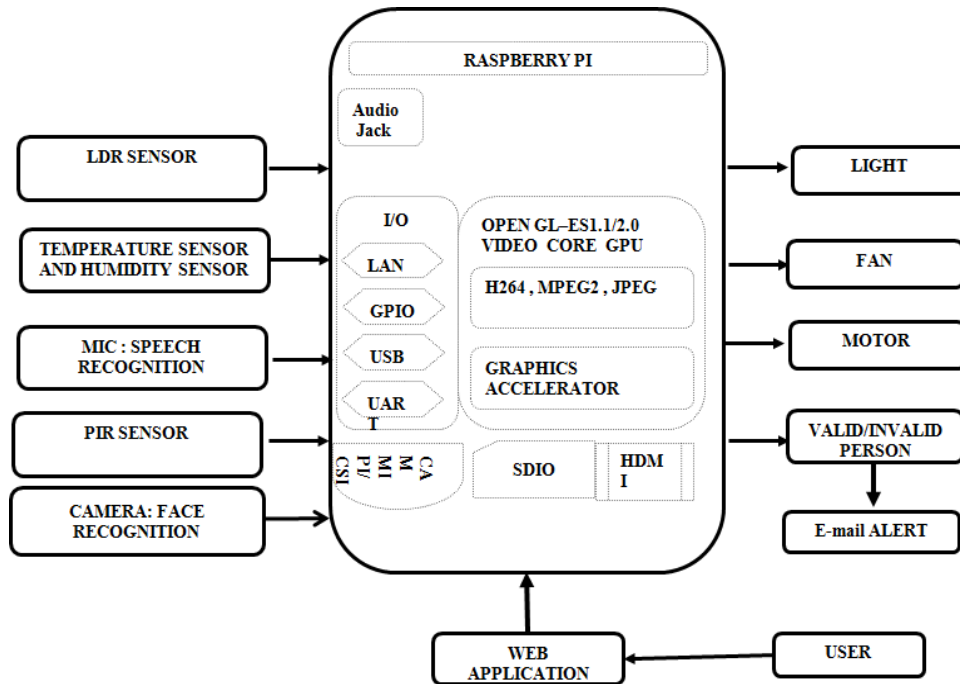


Fig .1 PROPOSED SYSTEM

III.MATERIALS AND METHODS

Materials used in this project are Raspberry pi with Wi-Fi module, Relay board with transistors, Temperature Sensor, Humidity Sensor, Light Dependent Resistor (LDR), PIR Motion Detector, Mic, Pi Camera

RASPBERRY PI WITH WIFI MODULE

Raspberry pi is a single board computer which runs on Linux based operating system and is best suited for Internet of Things.



Fig 2. Raspberry Pi with WiFi module

RELAY BOARD WITH TRANSISTOR

A relay is an electrically-operated switch which are connected to the power supply. Relay board are computer board with an array of relays and switches. It is used for ON/OFF of fan and light.

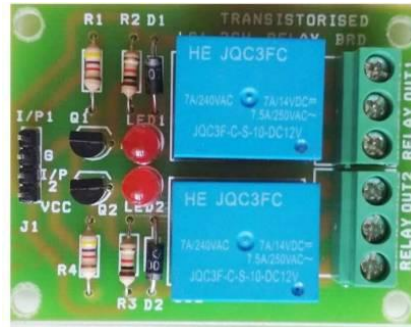


Fig 3. Relay Board With Transistor

TEMPERATURE AND HUMIDITY SENSOR

The temperature sensor is a device, which requires a thermocouple or Resistance Temperature Detectors (RTD) to measure the temperature through an electrical signal. The thermocouple is prepared by the two dissimilar metals in which it generates the electrical voltage indirectly proportional to the change in temperature in a precise manner or within the linear.

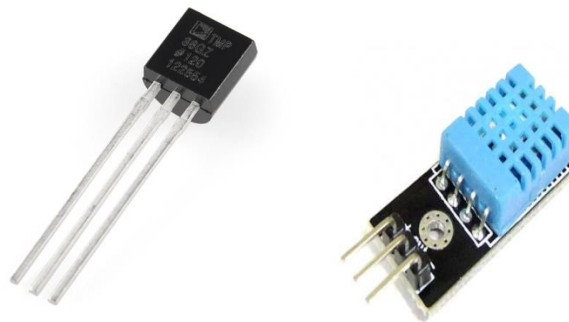


Fig 4. TEMPERATURE AND HUMIDITY SENSOR

PIR MOTION DETECTOR

Passive Infrared Sensors (PIRs) are electronic devices which are utilized in some security systems of alarms to detect the motion of an infrared emitting source such as person's body. The pyroelectric sensor which is made up of a crystalline material that generates a surface electric charge when it is exposed to heat in the form of infrared radiation. When the amount of the radiation striking the crystal changes, the amount of charge and also changes can then be measured with a sensitive FET device to build into the sensor.



Fig 5. PIR Motion Detector

WEB APPLICATION FLOW CHART

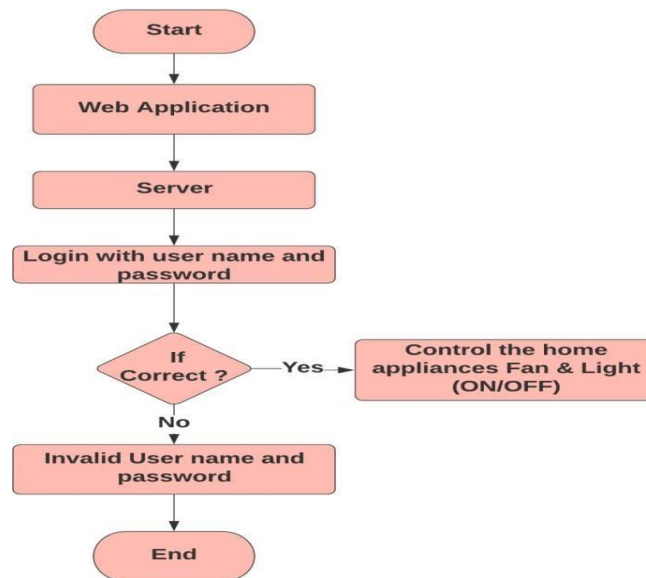


Fig 6. Flow Chart

IV.RESULT AND DISCUSSION

In this, the proposed method consists of a web application, and it is coded with an HTML program for the frontend, and PHP is used as backend web processing. Here raspberry pi is coded with a python program for monitoring the appliances and finally, the home appliances like fan and light are controlled anywhere, anyplace using web applications by the IoT.

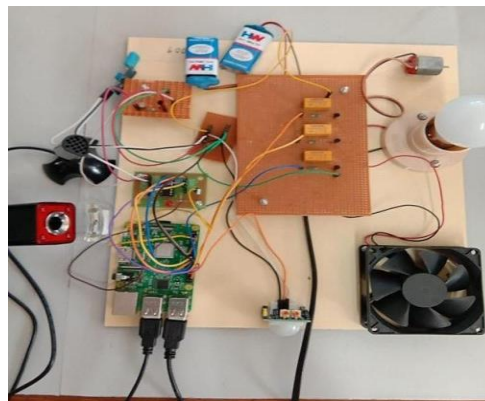


Fig 7. Hardware Module

V.CONCLUSION

The voice-controlled home automation using Raspberry Pi is proposed for the benefit of easy use and control of devices by elderly and disabled people. This proposed system provides basic home automation which can be easily implemented and used effectively for a real-time application of voice-controlled home automation. Thus, the Raspberry Pi is used to be a smart, economic, and efficient platform for implementing the home automation system.

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