INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN COMPUTER SCIENCE AND ENGINEERING TECHNOLOGIES

ISSN : 2454-9924

Smart Door System for Home Security Using Raspberry Pi

MANDAPALLI MONISH KUMAR[1], D.NAGENDRA BABU[2]

[1]PG Scholar, [2]Assistant Professor

Sree Rama Engineering College, Chittoor, AP-India,

E-mail: m.monish3690@gmail.com

Abstract:

In Recent, Home Automation is on horizon. Door Automation is emerging technology in Home Automation. From the last decades a number of standards have been defined for Door Lock Appliances. The main objective of Door automation is to provide Security locks for door, comfort, connivance security and energy efficiency for user with help of IOT and WSN. The aim of this Paper is to develop Door Automation application using Raspberry Pi and a web cam. Raspberry Pi operates and controls motion detector and cameras for remote sensing, surveillance capture the image of the intruder and sends it to the mobile phone of the owner and finally alerts the user about the intruder and also displayed on LCD when person detected or not. When any motion detected on that time the door will be open automatically. Programming has been developed in Python environment for Raspberry Pi operation.

Keywords: web camera, PIR Sensor, motor, LCD

PROPOSED SYSTEM

In this Project is very simple. A PIR sensor is used to detect the presence of any person and a web (usb) Camera is used to capture the images when the person presence it is detected.

Whenever anyone or intruder comes in range of PIR sensor, PIR Sensor triggers the usb Camera through Raspberry Pi. Raspberry pi sends commands to usb camera to click the picture and save it. After it, Raspberry Pi is used to open door means ON the motor. Here the pictures are saved in Raspberry Pi with the name which itself contains the time and date of entry.

BLOCK DIAGRAM

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN COMPUTER SCIENCE AND ENGINEERING TECHNOLOGIES

ISSN : 2454-9924

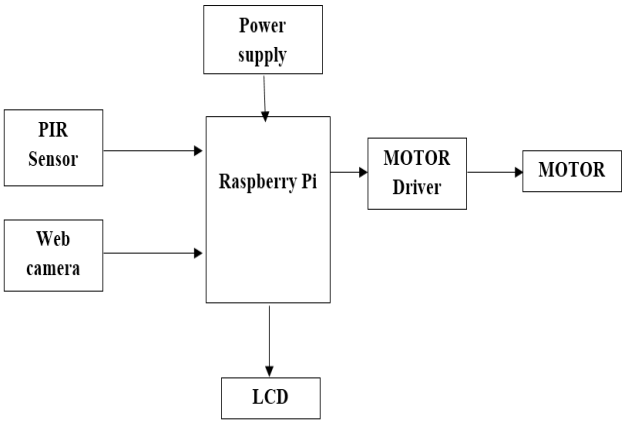

Fig 1: Block Diagram

HARDWARE COMPONENTS

Raspberry Pi:

The Raspberry Pi is an ATM card sized PC that fittings into your TV. It is a fit little PC which can be used as a piece of equipment wanders, and for an extensive part of the things that your work zone PC does, like spreadsheets, word-getting ready and diversions. It likewise plays superior quality video. We need to see it being utilized by kids everywhere throughout the world to figure out how PCs function, how to control the electronic world around them, and how to program.

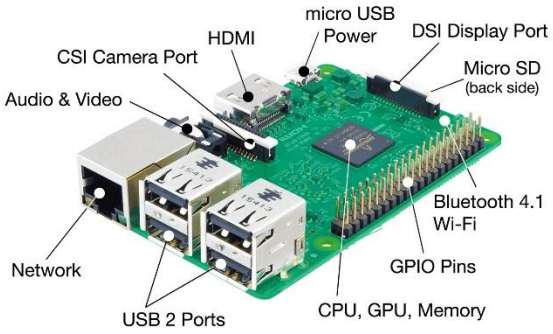

Fig 2: Raspberry Pi Module

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN COMPUTER SCIENCE AND ENGINEERING TECHNOLOGIES

ISSN : 2454-9924

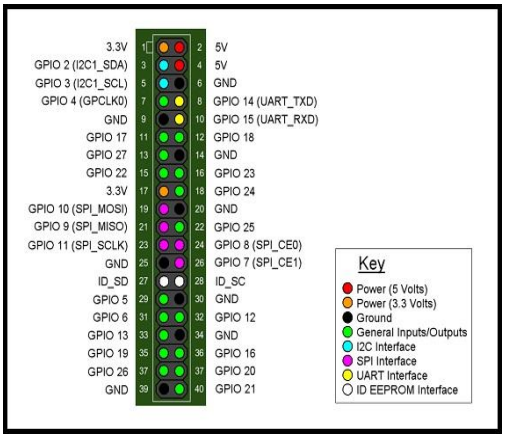

Fig 3: Pin Layout of Raspberry Pi GPIO Used In System

Power supply:

Transformers are contraptions which wander down a for the most part higher AC information Voltage into a lower AC yield voltage. To find the data and yield terminals of a transformer is outstandingly crude.

Fig 4: Transformer

Basically, there are two sides in a transformer where the bend bowing inside the transformer closes. Both terminations have two wires each. On the transformer, one side will have three terminals and the other will have two.

Rectifier:

Rectifier is a gadget which is utilized to change over AC voltage to DC voltage.

Fig 5: Rectifier

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN COMPUTER SCIENCE AND ENGINEERING TECHNOLOGIES

ISSN : 2454-9924

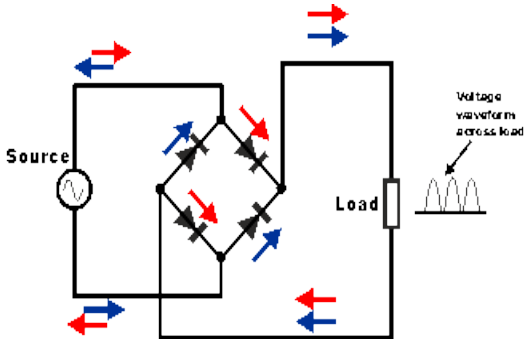

Fig 6: Rectifier Circuit

Capacitors:

Capacitors are utilized to get the immaculate and smoothest DC voltage in which the rectifier is utilized to get throbbing DC voltage which is utilized as a part of the light of the present destiny, from the connector. Capacitors are utilized to get square DC from AC current experience of the present channels so they are used as a touch of parallel to the yield. Moreover, if there is a swell in the data or yield, a capacitor changes it by discharging the charge set away in it.

Fig 7: Capacitor

Voltage regulators:

The 78XX voltage controller is principally overall utilized controller for voltage controllers. The XX speaks to the voltage of which the voltage controller delivers as the yield to the specific gadget. 7805 will deliver and control the yield voltage of 5v and 7812 will create the yield voltage of 12v. The voltage controllers are that they require no under 2 volts more than their yield voltage as information. For instance, 7805 will require no under 7V, and 7812, no under 14 volts as information sources. This voltage which ought to be given to voltage controllers is called Dropout Voltage.

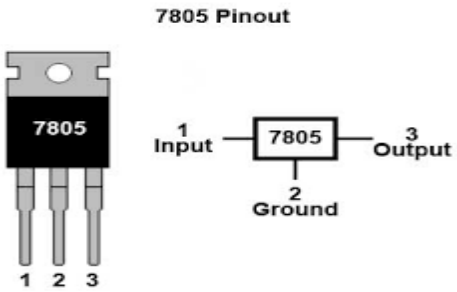

Fig 8: Voltage Regulator

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN COMPUTER SCIENCE AND ENGINEERING TECHNOLOGIES

ISSN : 2454-9924

The above segments are used to transform Alternative current to Direct current.

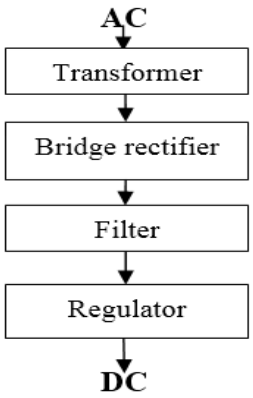

Fig 9: Flowchart of Power Supply

Sensors:

A sensor is a gadget that identifies and reacts to some sort of contribution from the physical condition.

PIR Sensor:

PIR sensor detects a human being moving around within approximately 10m from the sensor. This is an average value, as the actual detection range is between 5m and 12m.PIR are fundamentally made of a pyro electric sensor, which can detect levels of infrared radiation.

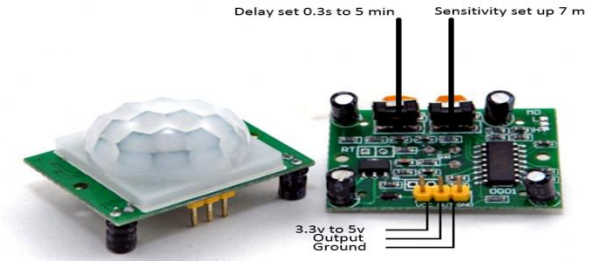

Fig 10: PIR Sensor

LCD (Liquid Crystal Display):

ISSN : 2454-9924

Due to their low price, availability and supportive developer, LCD modules are commonly used in most embedded projects. Most of us would have come across such displays in our everyday lives, either at PCO's or calculators. The presence and pinouts are being shown above; let's get a little technical now.

Since it has 16 sections and 2 lines, 16x2 LCD is named in that capacity. There are a large number of accessible availabilities like, 81, 8 URL, 102, 16 URL, and so forth. However the most as often as possible utilized mixes are the 16 URL. It will have an aggregate of 32 characters (16 premises2=32) and each character will comprise of 5 premises Pixel Dots.

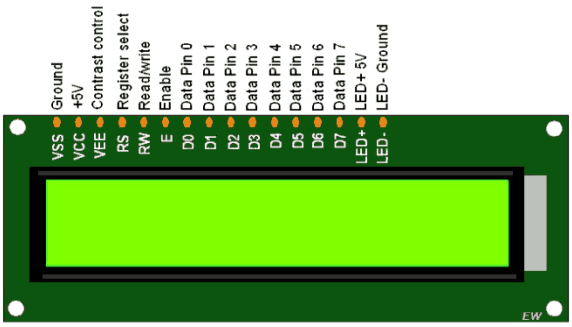

Fig 11: LCD

Motors

Motors are an anticlimax that converts electrical longing into offer that rule of thumb to rotate. It converts electrical fire in belly into technical energy. The basic principle of is when current and magnetic field are made to interact with each other than a force is formed with which the motor starts working.

Motor driver:

L293D is a dual h-bridge motive force circuit and the motor driver is an integrated circuit (IC). Motor drivers it will act as a low-current control signal .we cannot connect motors directly to Arduino because of two reasons, one is if we connect motors directly to current the back EMF will be produced by motors which will damage the Arduino board and other problem is that we cannot run motors in both directions if we connect motors directly to Arduino. So to overcome these problems we are using motor driver as a solution and we use L293D IC in this circuit. There are 4 input pins for l293d, pin 2, 7 on the left and pin 15, 10 on the right as shown on the pin diagram. Left input pins will regulate the rotation of motor connected across left side and right input for motor on the right hand side. The motors are rotated on the basis of the inputs provided across the input pins as LOGIC 0 or LOGIC 1.

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN COMPUTER SCIENCE AND ENGINEERING TECHNOLOGIES

ISSN : 2454-9924

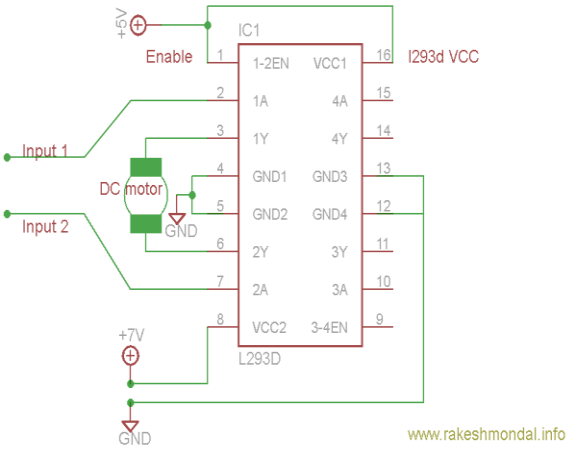

Fig 12: Motor Driver

SOFTWARE REQUIREMENT

Raspbian OS:

Raspbian OS is such of the no buts about it operating systems at hand without electronic commerce a dime to transform and use. The apparatus is chiefly based on Debian Linux and is optimized to employment effectively by the whole of the Raspberry Pi laptop. As we erstwhile know an OS is a reside of integral packages and utilities that murmur an indisputable hardware, in this position the Pi. Debian could be literally lightweight and makes a amazing in a class all by itself for the Pi. The Raspbian includes tools for surfing, python programming and a GUI computing device.

APPLICATIONS

- Used in homes, offices ,industrial areas etc.,

ADVANTAGES

- It provides security.
- Without human interface the door or window cannot be opened or closed.
- Alerting the user by using sensors.

CONCLUSION

In this paper, we have proposed a security monitoring system based on IoT technology. Our propose system consists of Raspberry Pi 3, Arduino, PIR sensor, web camera and buzzer. The novelty of our proposed system is the inclusion of human detection capabilityby HoG and SVM method and buzzer as method to warn the house owner. The simulation result shows that system can detect the intruder within seconds with accuracy of 89%. For future

ISSN : 2454-9924

research, we plan to explore other feature extraction and classification method to improve the accuracy of intruder detection.

REFERENCES

- Akash v Bhatkule - Home Based Security Control System using Raspberry Pi and GSM, International Journal of Innovative Research in Computer and Communication Engineering, vol. 4, pp. 16259- 16263, 2016.
- Anuradha.R.S, Bharathi.R - Optimized Door Locking and Unlocking Using IoT for Physically Challenged People, ternational Journal of Innovative Research in Computer and Communication Engineering, vol. 4, pp. 3397-3401, 2016.
- S. Nazeem Basha, Dr. S.A.K. Jilani - An Intelligent Door System using Raspberry Pi and Amazon Web Services IoT, International Journal of Engineering Trends and Technology (IJETT), vol. 33, pp. 84- 89, 2016.
- Nisarg Shroff, Pradeep Kauthale- IOT Based Home Automation system using Raspberry Pi-3, International Research Journal of Engineering and Technology (IRJET), vol. 4, pp. 2824-2826,2017.