



# OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

## VOICE CONTROL HOME AUTOMATION

Prof. Shaikh Sohail Mohiyodin<sup>1</sup>, Shaikh Anzal Sk. Ayaz<sup>2</sup>, Shaikh Mohammad Maaz<sup>3</sup>, Qureshi Tamjeed<sup>4</sup>, Zahed Khan<sup>5</sup>

HOD , E&C Department, EESCOET, Aurangabad, Maharashtra, India<sup>1</sup>

UG Student, EESCOET, Aurangabad, Maharashtra, India<sup>2,3,4,5</sup>

s.sohailmohiyodin@gmail.com

**Abstract:** This project revolves around creating a voice control home automation system, Prototype with the main focus on electric home appliances for example lights, A.C, Fans, door lock, other electric home appliances and security system through the internet. This system consists of a central device, internet (Wi-Fi), different sensors such as temperature sensor, motion sensor, gas leakage detection sensor, relay circuit and voice detection device. The central device is a microprocessor. In this case a raspberry pi that connects to the internet and receives an order through the internet (Wi-Fi) to control the relay circuit which controls the electric home appliances. The server manages users and device and handles the communication between the voice control device and central device. The appliances to be control are stored in data base on the server.

**Keywords:** Raspberry pi, Wi-Fi network, Electrical and Electronic Devices, Home Automation, Voice Detection Device.

### I INTRODUCTION

Due to the advancement in automation technology, life is getting simpler and easier in all aspects. In this paper we present how automation technology impacts our day to day life. The Homes of this era becomes more and more self-controlled and automated due to the automation technology. A home automation system is a system that allows users to control the electric home appliances more comfortably. The existing home automation systems are based on wired communication. The wired communication system required more space, the implementation of wired communication system cost more and may cause problems such as the cables can be damage and mislaid wires can cause tripping hazards.

In contrast, Due to the advancement in wireless communication system such as Wi-Fi, cloud networks in recent years it helps to ease the implementation of wireless home automation system.

#### Advantages of wireless home automation system

In recent years, the use of wireless system (Wi-Fi, cloud networks) become more common in home automation systems, the use of wireless system provide several advantages that could not be achieved by using a wired communication system.

1. As wireless frequency penetrates the walls, the wireless networks are easy to install anywhere based on the user choice. This flexibility is one of the great benefits of wireless communication system.
2. The use of wireless network can significantly reduce the installation coast since no cabling is needed. Where wired network required wiring which coast more.
3. Due to its compact components and portability, whole system can easily shift from one place to another place.
4. Wired devices have limitations of port and length of the wire whereas wireless devices do not.

### II SYSTEM OVERVIEW AND IMPLEMENTATION

Figure shows the overview of voice control home automation system. The system consists of voice detection device and different sensors such as temperature sensor, LDR sensor, motion detection sensor and gas detection sensor. And it also consists of central device which is connected to the internet (Wi-Fi) and relay circuit which is used to control the electric home appliances.

#### Voice detection device:

The voice detection device is use to take the voice command as an input from the user, And passes the input (voice command) to the central device in this case raspberry pi through the internet (Wi-Fi) as shown in the figure.

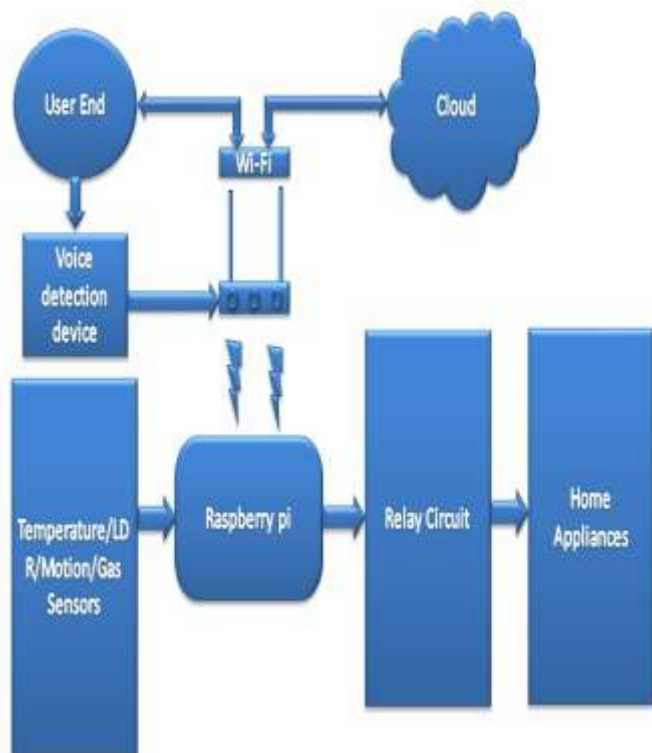


Figure 1 System overview

**Raspberry pi**

The raspberry pi is a credit card size single computer board, which can be used for many tasks that your computer does like word processing, spreadsheets, to play games and HD videos.

There are several versions of raspberry pi are available which features variation in memory capacity and peripheral device support. For this project we prefer raspberry pi 3B which is 10 times better in performance compare to raspberry pi 1 and 80% faster than raspberry pi 2 in parallelized tasks. The raspberry pi processes the input signal received from the voice control device and gives the output to the relay circuit.

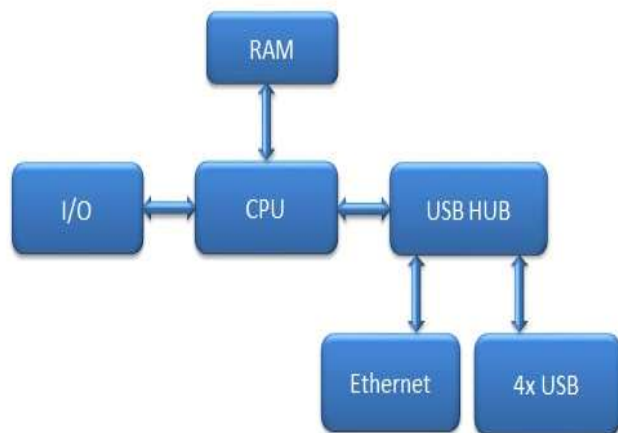


Figure 2 Block diagram of Raspberry pi

There are several versions of raspberry pi are available which features variation in memory capacity and peripheral device support. For this project we prefer raspberry pi 3B which is 10 times better in performance compare to raspberry pi 1 and 80% faster than raspberry pi 2 in parallelized tasks. The raspberry pi processes the input signal received from the voice control device and gives the output to the relay circuit.

**Specification of raspberry pi 3B:**

Processor	Broadcom BCM2387 Chipset, 1.2 GHz Quad Core ARM Coretex-A53 802.11 b/g/n Wireless LAN And Bluetooth 4.1
GPU	Dual-Core Video Core IV Multimedia Co-Processor, Provides open GLES 2.0, Hardware- Accelerated Open VG, And 1080p 30H. 264 High Profile D-code Capable of G Pixel per Second, 1.5 Gtexel/second or 24G FLOPs with texture filtering and DMA Infrastructure
Memory	1GBLPDDR2
Operating System	Boots from Micro SD Card, Running of Version of the Linux operating system or windows 10 IOT
Dimensions	85*56*17mm

**Connectors**

Ethernet	10/100 base T Ethernet socket
Video Output	HDMI (rev 1.3 and 1.4) Composite RCA (PAL and NTSC)
Audio output	Audio output 3.5mm Jack, HDMI, USB 4xUSB 2.0 Connectors
GPIO Connector	40-Pin 2.54mm (100 mil) expansion header: 2x20 strip providing 27 GPIO pins as well as +3.3V +5V and GND supply lines

**Sensors:**

The system consists of different sensors such as Temperature, Motion, LDR, and Gas sensor. As shown in the figure the raspberry pi is connected to the internet (Wi-Fi). When the connection is stabilized it will starts reading the parameters of sensors. The threshold level for the sensors is set as S1, S2, and S3 etc. The sensors data is send to the web server and stored in the cloud. The data can be analyzed from anywhere and anytime. When the sensor parameters are greater than the threshold level than the respective alarm will be raised and the required action is done, for controlling of the parameters.

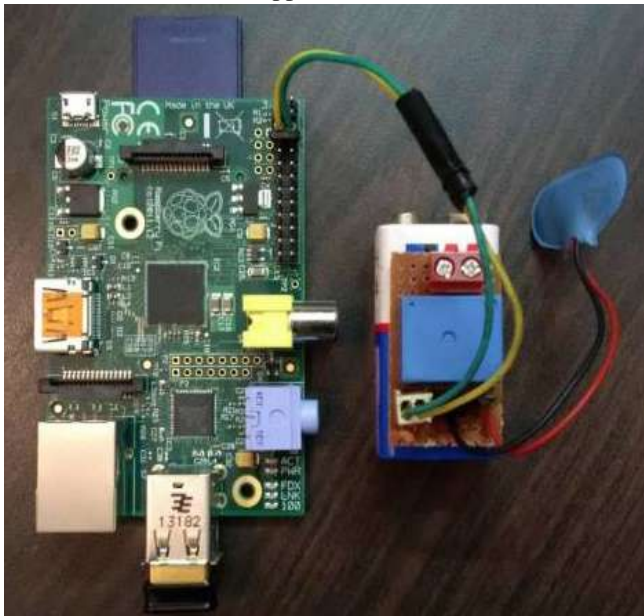
**Relay Circuit:**

Relay is an electric switch which is controlled by both electrically and mechanically. Relay is used to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.

In this system relay receives an input command from raspberry pi to operate the electric home appliances

accordingly. There are several relay circuit such as 2 channel relay, 4 channel relay and 8 channel relay.

Below figure shows the raspberry pi model 3B connections with 1 channel relay circuit which is use as a switch for electric home appliances.



**Figure 3 Connection between raspberry pi and relay circuit**

### III CONCLUSION

The home automation system using voice detection device has been experimentally proven to work satisfactorily by connecting electric home appliances to it and the appliances successfully controlled by voice commands through internet (Wi-Fi). And the system not only monitors the data, but also actuates the process accordingly.

### REFERENCES

[1] Raspberry pi [www.raspberrypi.org](http://www.raspberrypi.org)  
 [2] Faisal Baig, Saira Beg and Muhammad Fahad Khan, "ZigBee Based Home Appliances Controlling Through Spoken Commands Using Handheld Devices", 2013, International Journal of Smart Home, Vol. 7(1), pp 19 - 26  
 [3] Nicholas D., Darrell B., Somsak S., "Home Automation using Cloud Network and Mobile Devices", IEEE Southeastcon 2012, Proceedings of IEEE.  
 [4] Bader M. O. Al-thobaiti, Iman I. M. Abosolaiman, Mahdi H. M. Alzaharani, Sami H. .Almalki, Mohamed S. Soliman, "Design and Implementation of a Reliable Wireless Real-Time Home Automation System Based on Arduino Uno Single-Board Microcontroller", 2014, International Journal of Control, Automation and Systems, Vol. 3(3), pp. 11 - 15.  
 [5] S.D.T. Kelly, N.K. Suryadevara, S.C. Mukhopadhyay, "Towards the Implementation of IoT for Environmental

*Condition Monitoring in Homes*", IEEE, Vol. 13, pp. 3846-3853, 2013  
 [6] Wikipedia. (2012, 12th December). *Home automation*. Available: [http://en.wikipedia.org/wiki/Home\\_automation](http://en.wikipedia.org/wiki/Home_automation)  
 [7] Basma M. Mohammad El-Basioni<sup>1</sup>, Sherine M. Abd El-kader<sup>2</sup> and Mahmoud Abdelmonim Fakhreldin<sup>3</sup>, "Smart Home Design using Wireless Sensor Network and Biometric Technologies" at Volume 2, Issue 3, March 2013  
 [8] Muhammad IzharRamli, MohdHelmyAbdWahab, Nabihah, "TOWARDS SMART HOME: CONTROL ELECTRICAL DEVICES ONLINE", Nornabihah Ahmad International Conference on Science and Technology: Application in Industry and Education (2006)  
 [9] Kundukulam EJ, Sudharson A." *Implementing and optimizing template matching techniques for home automation*". Indian Journal of Science and Technology. 2015; 8(19)