

# Home Automation using IOT and Speech Signal

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**Abstract—** Home Automation implies controlling of home appliances and features automatically and in some cases remotely using smart phone. Speech based home automation utilizes human voice orders to operate the electrical appliances in the home. It is extremely helpful for individuals and particularly for elderly and physically weakens people. These paper we developed home automation prototyped using Raspberry Pi and IOT. We present the implementation of home automation using two technologies. The First technology uses human speech technology for controlling electrical appliances when we are at home. It uses jasper software to recognize speech command and raspberry pi module for switch on or off. The second scheme uses Google app on smart phone and IOT for controlling electrical appliances when person is out of home. Raspberry pi 3B module is developed by using ARM11 microcontroller. The developed system also alerts the user about any instruction into the house when we are out of home. Relays and electrical appliances are used as load to demonstrate the working of the prototype system. Home automation using speech signal gives relaxation, comfort and security to control home appliances or office. Recommend system control electrical home equipment with human speech signal and IOT devices and easy of installation.

**Keywords—** Home Automation, IOT, Raspberry pi 3B, speech signal.

## I. INTRODUCTION

With the quick change of innovation, we as a whole have an exceptionally busy life and one can consider living in a safe place instead of getting it focused. So for what reason would we be able to utilize innovation to improve things? Home Automation is the primary way to deal with this, which has moved toward becoming and will turn into a pattern in 21st and the forthcoming century. Home Automation is a term used to depict the working of all family highlights and devices together [1]. We are influencing it to control from our day by day utilize or things particularly home devices like light on/off close up and cool on/off utilizing Internet availability and additionally utilizing discourse flag. As per the insights report, it has been recorded that from 2005 to 2015 the expansion in Internet

clients is been expanded from 1,024 to 3,207 million and will build more later on. Portable's cell phones and workstations are the methods from which one can utilize the Internet whenever and from anyplace. Along these lines, on the off chance that we will on/off the light that interfaces you to your different day by day home machines then we can control our home.

The home assignments that resembles initiating or remaining entryways and home Windows and moreover attaching and opening them, for a couple of people, these exercises are substantial commitments. Extraordinarily, for elderlies, handicap people, as legitimately as occupied people or occupied family units. Be that as it may, these exercises can be encouraged by utilizing growing a device like home computerization.

## II. LITERATURE SURVEY

Show the utilization purposes of interest of two designs use the Bluetooth development for controlling of electrical applications when we are at home. Second arrangement of this to uses GSM/GPRS advancement for controlling the electrical machines [3]. The bits of knowledge about the blueprint of a remote home automation system which has been combined and execute. The motorization center around confirmation of voice sends for and utilizes low power RF zigbee remote correspondence modules [2]. This robotization acknowledgment of voice summon gives the client and this voice order exchange towards the microcontroller. Additionally utilizing Raspberry Pi microcontroller module to execute our vision. This application will be help the client to set a specific console which is talk the client and the take after by a charge will execute the coveted order [1]. The actualize in the current foundation of any home with no sort of changes in the current associations. Here in implantation utilized different techniques there are information earning and FSK balance and demodulation [4]. When planning a discourse acknowledgment application on the cell phone which has not to expend a ton of capacity memory. This framework execute to a low inward stockpiling memory it should be possible by utilizing the Google cloud discourse application on android cell phone application. The

coordinated this all procedure at that point gives achievement result for every one of the summons. It is expansion utilizes the signs increase to actuators are still inside range which is accepter in a work zone around the base [5].

### III. HARDWARE DESCRIPTION

The controller is trained with the speech signal after which the command is saved into the database. The microphone is used to receive the speech signal from the person. The Raspberry Pi cannot recognize message or speech signal then jasper software can be used to convert speech to text. Microphone gives speech signal to Raspberry Pi. Then Raspberry Pi acknowledges the text signal and controls the appliances in keeping with that commands. The appliances to be managed had been interfaced with Raspberry Pi the use of relay motive force circuit because of different strength ratings of devices and Raspberry Pi. When person is an out off home then the home appliances are controlled using the personal digital assistance (PDA) through internet. Enter the IP address in the web browser and using webserver we can on/off the home appliances.

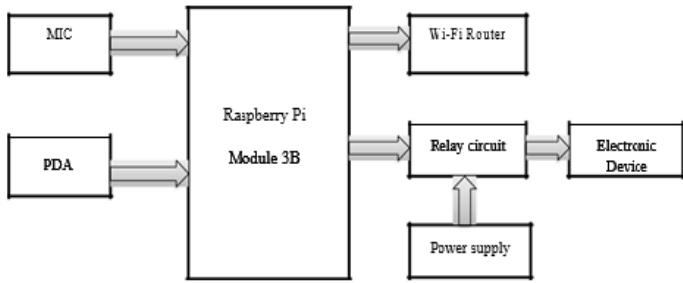


Figure 1. Block Diagram

A brief description of various components used is in this section:

- **USB Microphone and Voice Recognition:**

Microphone used to get voice charges to the voice acknowledgment module is a basic neckline compose receiver with 3.5mm jack. For this venture utilize receiver of webcam. The discourse contribution from receiver is given to the Raspberry Pi and there input discourse is contrasted and charge arrange document in Raspberry. Pi Jack Converter is simple 3.5mm male to USB female jack converter used to connect the microphone through the Raspberry Pi.

- **Raspberry pi 3B:**

Raspberry Pi 3 version B out in February 2016 is bundled with on-board Wi-Fi, Bluetooth and USB Boot. All models characteristic a Broadcom machine on a chip (soc), which contains an ARM well matched imperative processing unit (CPU) and an on-chip photos processing unit. CPU speed tiers from seven-hundred MHz to at least 2 GHz for the Pi 3 and on board memory range from 256 MB to 1 GB RAM. Relaxed virtual (SD) playing cards are used to keep the

working system and application memory in both the SDHC or Micro SDHC sizes. Most opportunities have among one and four USB slots, HDMI and composite video output 5 mm phone jack for audio. Lower degree output is provided by a number of GPIO pins which aid common protocols like IC. The B-fashions have an 8P8C Ethernet port and the Pi 3 and Pi zero have on board Wi-Fi 802.11n and Bluetooth. The Muse presents Raspbian, a Debian-based Linux distribution for down load as well as third birthday party Ubuntu, windows 10 IOT center, RISC OS and specialized media center distribution. It promotes Python and Scratch as the main programming language with assist for lots other languages (i.e., [3]).

### IV. SOFTWARE DESIGN

#### 1. Jasper software:

Jasper is planned particularly for the Raspberry Pi (Model B) and requires some extra equipment like a Wi-Fi connector and USB amplifier. In straightforward terms, Jasper is a product toolbox for the treatment of voice information and also picture information. The product gives a way to speaking to voice and encourages the control of picture information and additionally the import/fare of such information in various configurations (e.g. JPEG-2000 JP2 JPEG , PNM , BMP , Sun Raster. The import usefulness supports the auto-identification of the picture arrange, taking out the need to clearly distinguish the configuration of coded input information. A basic shading administration motor is likewise given so as to permit the exact representation of shading. The Jasper programming comprises of a library and a few application programs. The code is composed in the C programming language. This language was picked essentially because of the accessibility of C advancement situations for a large portion of today figuring stages. At introduce, Jasper comprises of around 40K lines of code. Even though written in C, the Jasper library can be effortlessly coordinated into applications written in the C++ programming language also.

#### 2. Putty:

Python is a superb, solid, capable and extremely mainstream programming language which uses to build up a code. The exceptional programming language of the Raspberry Pi is Python. Python is a simple programming language that keeps running on any stage. Putty is a free and open-source terminal emulator, serial reassure and system record exchange application. It encourages a few system conventions, including SCP, SSH, Tel-net, rlogin and crude attachment association. It can likewise associate with a serial port. Putty programming is accustomed to signing into the Raspberry Pi. All python code which is required is dumped in the Raspberry Pi board. Wi-Fi is utilized to interface Raspberry Pi to web which is making its own particular web condition (i.e., [3]).

#### 2. Apache Software:

The Apache software basis (ASF) is a non-earnings organization that oversees improvement of Apache software. The corporation turned into founded in 1999 is based in woodland Hill, Maryland. Club is primarily based on contribution to the muse's open source projects; character candidates should be nominated and accepted with the aid of a majority of participants. Corporations are not eligible for club. The ASF currently oversees more than 100 pinnacle-degree tasks (TLPs), a lot of which additionally have subprojects. Top-stage tasks encompass: Apache HTTP server, a freely available net server that runs on maximum operating systems along with UNIX, Microsoft home windows, Mac OS/X and Netware. Cassandra, an open supply allotted database machine designed for storing and coping with huge amounts of information across commodity servers. Cloud stack, a cloud control platform for handing over Infrastructure-as-a-carrier (IaaS) in cloud computing environments. Keep, an open-source facts Warehouse gadget for querying and analyzing large information units saved in hoop. Hoop is unfastened, Java-based programming framework that supports the processing of huge statistics sets in a distributed computing environment (i.e., [3]). Despite the fact that there is some hypothesis that the name Apache was created as a play on phrases (a patchy internet server), the muse says that the pun is coincidental. Consistent with the ASF, the call changed into selected in tribute to "the numerous local American countries collectively known as Apache, famous for their advanced capabilities in war strategy and their in exhaustible patience.

V.  
VI.

#### IV. RESULT:

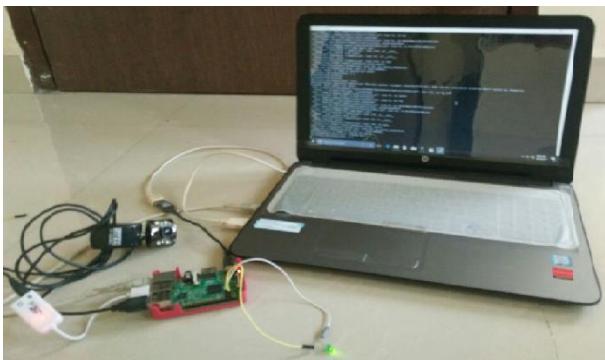


Figure2: LED ON

Operate automatically home electrical appliances using speech command. Developed Python integrated environment to convert speech signal into electrical signal. Control the electrical appliances through Raspberry Pi. Implement home automation using web interface and http protocol.

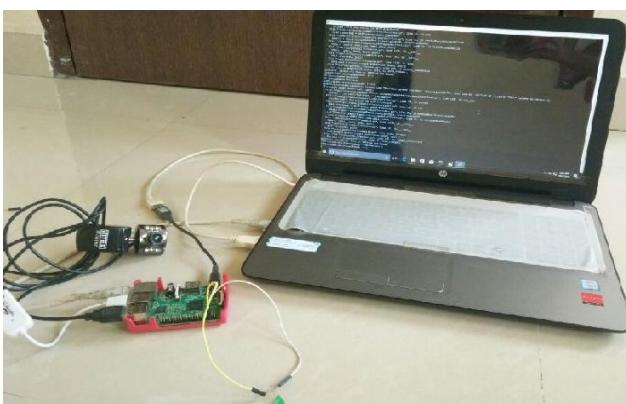


Figure3: LED OFF



Figure4: Webserver light ON-OFF  
CONCLUSION:

A home automation structure in view of speech acknowledgment was manufactured and actualized. It is very useful for human beings especially for elderly and physically handicapped people, medical emergency, speech controlled appliances and toys. The model created can control electrical appliances in a home or office. The framework realizes Automatic Speech Recognition through Jasper programming in Raspberry Pi. The framework executes the remote system utilizing HTTP server for their ability and low power utilization. Smart home technology, the living conditions of people have been improved greatly. Later on, we consider that it is a smart thought to apply the PC vision to understanding home something other than the robot. At that point the appliances can make reactions ahead of time.

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