

SMART VIRTUAL ASISTANT AND AUTOMATION VIA VOICE COMMAND

Mr. SAHIL B. BHONGADE
ENTC Department
DMIETR, Sawangi Meghe
Wardha, India
bhongadesahil@gmail.com

Mr. PRASAD V. ISASARE
ENTC Department
DMIETR, Sawangi Meghe
Wardha, India
prasadisare29@gmail.com

Mr. MUKUL S. WANJARI
ENTC Department
DMIETR, Sawangi Meghe
Wardha, India
mukulwanjari02@gmail.com

Ms. MAYURI R. BABHULKAR
ENTC Department
DMIETR, Sawangi Meghe
Wardha, India
mayuribabhulkar5@gmail.com

Ms. DEEPALI R. GHONGADE
ENTC Department
DMIETR, Sawangi Meghe
Wardha, India
ghongadedeepali@gmail.com

Ms. PURVAJA S. TAYADE
ENTC Department
DMIETR, Sawangi Meghe
Wardha, India
purutayade001@gmail.com

Abstract— A voice command system process voice as an input, decodes or understand the meaning of that input process it and generate appropriate voice output and vice versa. The present system of reception desk works manually. We must provide one person which is dedicated to that desk which will perform all the work that includes visitor's database management, allotting appointments etc. This is somewhat finically not affordable. This can be solved by using proposed system, that will work on the raspberry pi which will be interfaced with two sections that contains PIR sensor, camera, microphone, fingerprint sensor, relay, speaker. The proposed system will use the voice to text and text to voice converter that will be implemented in the raspberry pi

Keywords: Raspberry Pi, PIR sensor, camera, fingerprint sensor, relay, speaker, microphone, voice to text, text to voice.

I. INTRODUCTION

Smart Virtual Assistance and Automation via Voice Command is a voice command system that process voice as an input, decodes or understand the meaning of that input process it and generate appropriate voice output. Any voice command system needs three basic component which are speech to text convertor, query processor and a text to speech convertor [1]. Voice has been a very integral part of communication now a days. Since, it is faster to process sound and voices than to process written text, hence voice command system are omnipresent in computer devices. There have been a very good innovations in the field of speech recognition [2]. Some of the latest innovation have been due to the improvement and high usage of big data and deep learning of this field.

Our system uses same functionality of text to voice and voice to text conversion. Our system has two section that are

cabin section and visitor section. Visitor section contain a PIR sensor, camera with inbuild microphone, speaker. The cabin section also contains the microphone and speaker. In cabin section there is also some relay provided which will used to provide automation of devices such as light and fan. When the master of the cabin is arriving in the cabin, he will first give his fingerprint for the authentication and after it the system will recognize that the Master of that system is in cabin and according to his voice input it will on or off the devices. At the visitor section the PIR sensor will detect the incoming visitor and greet him and asked for his details and his message for man and that message will give to the master and his details so that master can recognize that person and according to the situation master will allow or not allow the visitor for the visitor.

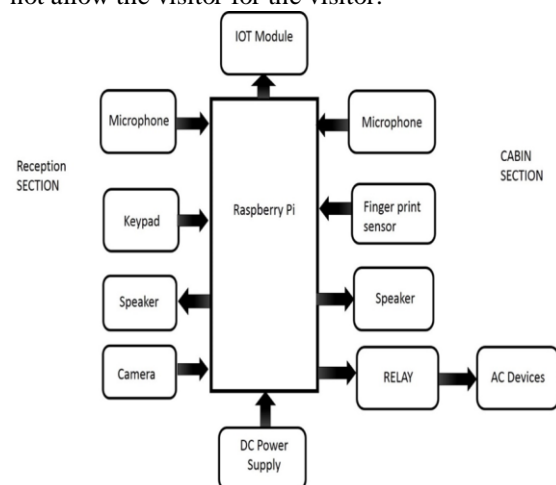


Fig 1.1: Block Diagram of Smart Virtual Assistant Via Voice Command

If the visitor comes in the absence of master, then the system will convert text msg of master into the voice and

says to come later when the master is in the cabin and capture the visitor's image and send it to master's email as a notification.

A fingerprint sensor is an electronics device use to capture a digital image of the fingerprint pattern. This type of sensor is a specialized type of digital camera. The top layer of the sensor where the finger is placed this known as the touch surface. Beneath this layer the light emitting phosphor layer which illuminate the surface of the finger.

Automation system makes the operation of the various home application more convenient and save the energy with the energy saving concept. Automation include in this system is operation on of fan and light [5].

II. METHODOLOGY

The proposed system objectives are to provide two-way communication by using voice to text and text to voice. Also, the proposed system uses the fingerprint authentication for the acknowledgement of the master in the cabin. PIR sensor is used in the proposed system to detect the person in the visitor section of the proposed system. Relays are used in the proposed system to be used as a switch to operate the devices.

A. Voice to Text and Text to Voice

Voice to text and text to voice is a type of speech recognition program that converts spoken words to written language and vice versa. Voice to text was originally developed as an assistive technology for the hearing impaired. Its applications were limited primarily because older voice to text program had to be trained to recognized specific person speech before attaining an acceptable level of accuracy. The text to speech service understands text and natural language t generate synthesized audio output complete with appropriate cadence and intonation [1,2,3,4].

B. Fingerprint Authentication

Fingerprint authentication which propose system use to verify the identity of person. It is also used to determine the presence of person. Using the raspberry pi fingerprint system, the proposed system can enroll new fingerprints in the system and can delete the already fed fingerprint. The proposed system uses the fingerprint as the authentication of person and to determine whether the person is in the cabin or not. Fingerprint processing includes two parts: fingerprint enrollment and fingerprint matching.

When enrolling, users' needs to enter the finger two times. The system will process the two-time finger images, generate a template of the finger based on processing results and store the template. When matching user enters a finger through optical sensor and system will generate a template of the finger and compare it with templates of finger library. For 1:1 matching system will compare the live finger with specific template designated in the module; for 1: N matching, or searching, system will search whole finger library for the matching finger. In both circumstances, system will return the matching result, success or failure [6].

C. Raspberry Pi

The raspberry pi is the low cost, credit card size computer that plugs into a computer monitor or tv and uses a standard keyboard and mouse. It is capable little device that enable people of colleges to explore computing, and to how to program in languages like Scratch and Python. Its capable of everything you would expect a desktop computer to do, from browsing the internet and playing high definition video to making spreadsheets, word processing, and playing game.

What's more, raspberry pi can interact with the outside world and has ben used in a wide array of digital maker system, from music machines and parent detectors to weather stations and tweeting bird houses with infrared camera.

D. PIR sensor

The PIR sensor are tuned to detect the IR wavelength which only emanates when a human being arrives in their proximity. The term "pyroelectricity" means heat that generate electricity. Since these sensors do not have an infrared source of their own, they are also termed as passive. The term passive in this instance refers to the fact that PIR devices to not generate or radiate energy for detection purpose. They work entirely by detecting infrared radiation by or reflected from objects. They do not detect or measures heat.

E. Relay

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid states relays. Relays are used where it is necessary to control a circuit by sperate low power signal, or where several circuits must be control by one signal. The first relay was used in long distance telegraph circuit as amplifiers: they repeated the signal coming in from one circuit and retransmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

III. RESULT & DISCUSSION

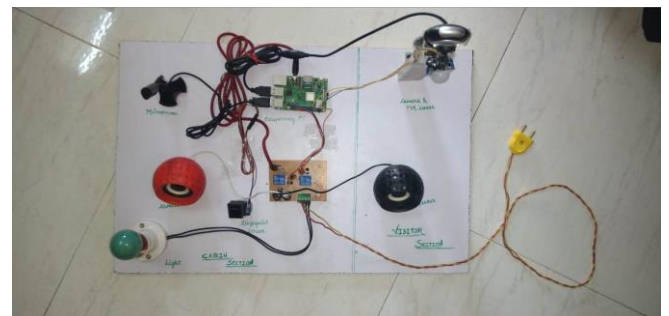


Fig. 4.1: Implemented Proposed System

Proposed system is divided into two sections which are cabin section and visitor section. Firstly, the authentication of the master is done by the fingerprint sensor. Then system will get acknowledgement of that the master in the cabin. Then though speech to text engine it follows the command

of the master via voice command and the result is verified. When the visitor comes it will be sensed by the PIR sensor and according to that the system will give output in machine voice and take the input in terms of voice. The given input in voice is converted into text and then vice versa. The same message is transferred to the master and his command is also taken in voice and it is also converted into speech to text and text to voice using voice engine. Thus, we provide two-way communication between visitor section and cabin section.

IV. CONCLUSION

The proposed system provides a big benefit to the user since the manual work of receptionist get reduced as in the traditional system a person must be there all the time to do the work of the receptionist. This will be solved by the proposed system. The user gets another big reason to use this system is that salary required to pay to the person get reduced to one-time payment. Another advantage of this system to the user is that user get notification of the visitors that come to visit them in their absence also the database of the visitor gets notified to the user through the mail.

V. REFERENCES

- [1] P.V.N. Reddy, "TEXT TO SPEECH CONVERSION USING RASPBERRY PI FOR EMBEDDED SYSTEM", International Journal of innovation Research in Science, Engineering and Technology, vol 1, issue 1, Nov 2012.
- [2] M. Sudhakar, Vandana Khare, D Vijay Krishna Kanth, "SPEECH TO TEXT CONVERSION & DISPLAY USING RASPBERRY PI", IORS Journal of Computer Engineering (IORS-JCE), vol 19, Issue 4 Ver.III Jul-Aug 2017 PP 14-18
- [3] Surinder Kaur, Sanchit Sharma, Utkarsha Jain and Arpita Raj," VOICE COMMAND SYSTEM USING RASPBERRY PI", Advanced Computer Intelligence: An International Journal (ACII), Vol 3, No. 3 July 2016
- [4] Harshada Rajput, Karuna Sawant, Dipika Shetty, Punit Shukla," VOICE BASED HOME AUTOMATION SYSTEM USING RASPERRY PI", International Reaserch Journal of Engineering and Technology (IRJET) vol. 5, issue 4, April 2018, Page 1154
- [5] Shubham Oulkar, Ram Bamane, Sagar Gulave and Pravin Kothawale, "VOICE CONTROLLED HOME AUTOMATION USING RASPBERRY PI" International Journal of Recent Innovation in Engineering Research, vol.2, issued 1 Jan 2017, page no. 28
- [6]Jordy Sapes and Francesc Solsona ,"FINGER SCANNER: EMBEDDING A FINGERPRINT SCANNER IN A RASPBERRY PI", MDPI, 6 Feb 2014,