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IOT based Voice Controlled System for Smart Applications

Mr. Venkateshwar A[1], Sonali. L[2], Varnika. M[3], Megha P. A[4], Megha S. R[5]
[1]*Asst. Professor,* [2,3,4,5]*B.E Student, Dept of CSE, BITM, Ballari, Karnataka, India*

Abstract: ***People who are working are so busy so that they often forget to turn off their electrical appliances when they are leaving the house for work. Those appliances consume the electricity whole day so it leads to huge amount of electricity to go waste. So to overcome this problem IOT based Voice Controlled system is introduced to automatically switch ON and OFF of electrical appliances, to check the water level in the overhead tank and operate the motor accordingly and also to monitor the moisture content in the soil which helps to switch on/off the sprinkler to water the garden to avoid the problem of unnecessary waste of water. This project presents the design of the home automation system using the IoT (Internet of Things) technology along with the feature of voice recognition and also the manual operation. The voice based system listens for the user's speech and whenever a defined phrase is identified it triggers corresponding action to switch appliances on or off. With speech recognition physically challenged people can control appliances with much more ease.***

Keywords: IOT, voice, Raspberry Pi, Python, electrical appliances, android application, Moisture sensor , ultrasonic sensor.

I. INTRODUCTION

As technology is increasing day by day, people are becoming more lazy and everything what they do in their daily lives should be automated. The main motto of an automated system is to make every activity available on finger tips in order reduce human intervention, time, efforts, and also the errors that occur due to human negligence. Nowadays, android mobiles are common among everyone due to its feature of portability and user friendly interface, so to make a productive use of this android devices this project is introduced to control the appliances like lights, fans, water pump and sprinkler through voice using the android application. This project is based on Internet Of Things (IOT) to control the appliances wirelessly over the internet using Raspberry pi microcontroller board. The Internet of Things (IoT) is the inter-networking of physical devices, vehicles, buildings, and other items embedded with electronics, software, sensors, actuators and network connectivity that enable these objects to collect and exchange data. Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse which can used for developing various applications. In this project we use Python programming language which by default provided by the Raspberry Pi microcontroller board. This system requires Raspbian OS and micro SD card ,MySQL for connectivity and also to store commands. In this project we are using android application in which user will give the voice commands like "switch on light" which is in turn matched with pre-defined phrases stored in cloud and then the respective appliances are turned on/off accordingly. Thus by using this we can convert "normal" homes into "smart" homes.

II. LITERATURE SURVEY

In paper [1], The Home automation is done a RF-microcontroller cc2538 is used, cc2538 is the wireless microcontroller System on Chip(SoC) that is used for high performance ZigBee applications. A wireless technology like 6LoWPAN is used for connecting wirelessly, this 6LoWPAN has the feature of minicomputer along with GPIO pins to which other devices can be connected. Here the operating system called Contiki is used ,it is an open source operating system. In this project user provides the commands which transfers to home automation server and automates the incoming commands. The primary goal here is to convert the manual switch in the house into a smart switch that can be able to control from a remote location. The disadvantage here is the OS system Contiki runs only on the tiny low-power microcontrollers.

In paper[2], Automation is done using Raspberry Pi, Android application and Java as main programming language. It presents a low cost and flexible home control of electrical appliances and monitoring system using Raspberry PI module, the system does not require a dedicated server pc unlike the other systems and offers a novel communication protocol to monitor and control home environment effectively. These technologies which are used in this project are free open source software. This system primarily concentrates on controlling the lightning devices, control of doors and home security using internet as an primary communication protocol. The limitation here is the security is not provided.

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In paper[3], Automation of electrical appliances is done using Raspberry Pi microcontroller, Android Application and Python as programming language. Here the user provides voice command using android application that is required to switch on/off the electrical appliances by using Wi-Fi as the communication protocol. This project is mainly developed to provide easier interface for elderly people and physically disabled people to control the electrical appliances.

In paper[4], Here IOT based sensing and monitoring system for smart homes that uses EmonCMS platform for collecting and visualizing monitored data and remote controlling of home appliances and devices is done. The EmonCMS platform is flexible and user friendly .The sensing of different variables inside the house is carried out using NodeMCU-ESP8266 microcontroller board. In this system one Hub is made to measure temperature, humidity, light, intensity, proximity, CO2 levels. This Hub can be placed in any of the room in the house either above the ground level or below the ceiling level. The devices used in this system are very complex and expensive, lack perceived value and trustworthiness.

In paper[5], Converting "normal" homes into "smart" homes is done using Raspberry Pi microcontroller , Python programming language and various sensors like LDR sensor, temperature sensor, PIR sensor. In this all the devices are connected to a single board in order to reduce the use of electricity. The electrical appliances like lights, fans, electric heater, survillence system, doors by processing the data collected from the sensors.

Sl.no	Title	Technology Used	Result
[1]	Design and Implementation Of Home Automation Using Power Electronic Switches (2016)	RF-Microcontroller SoC(cc2538), Wireless technology like 6LoWPAN, and Contiki OS	Automation Using user command via RF-Microcontroller
[2]	Raspberry Pi Home Automation using android application (2017)	Raspberry Pi, Android Java, PHP	It helps in Automation such as control of light, control of door to ensure home security
[3]	Voice Based Home Automation System Using Raspberry Pi (2018)	Raspberry Pi, Android Python	To regulate basic home appliances based on voice command of user.
[4]	Smart Home Automation Using IOT-Based Sensing And Monitoring Platform. (2019)	NodeMCU-ESP8266 Micro-controller Board, EmonCMS Cloud Server, various sensors	To automatically Control the devices like Smart LEDs and AC depending on data collected by sensors.
[5]	Smart Home Automation System By Integrating Sensors And Raspberry Pi (2019)	Raspberry Pi, Python, various sensors.	To Operate doors, lights, fan, electrical heater survillance system depending on data provided by sensors.

Table 1. Overview Of Referred Papers

III. PROBLEM STATEMENT

To design and develop " IOT Based Voice Controlled System for Smart Applications" using Raspberry Pi.

IV. PROBLEM IDENTIFICATION

As observed in the literature survey most of the projects implemented till date are all concentrated on the electrical appliances like lights,fans electrical doors, heaters, Air conditioners etc. So in order to extend this we have come up with the project where the basic electrical appliances like lights and fans along with gardening management and over-head water tank management are controlled using the voice command by utilizing the emergent technologies like IOT, Raspberry Pi, Android etc.

A. Features of Proposed System

1) To switch ON and OFF of electrical appliances based on voice command.

2) To check the water level in the overhead tank and operate the motor according to the level of water detected by ultrasonic sensor.

3) To reduce the manual work involved in gardening process by detecting the moisture content in the soil using moisture sensor.

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B. Objectives

1) To analyze smart way of operating home appliances with the help of emergent technologies like IOT.
2) To develop a voice controlled system which is easy to install and configure.
3) To design a secure and reliable web portal for the user to control the home appliances through voice.
4) To implement water resource management and gardening management to overcome the problem of unnecessary wastage of water.

V. METHODOLOGY

A. System Architecture

System architecture shows the overall flow of the project and how the one system component is connected to other component and also the role of each component in the project.

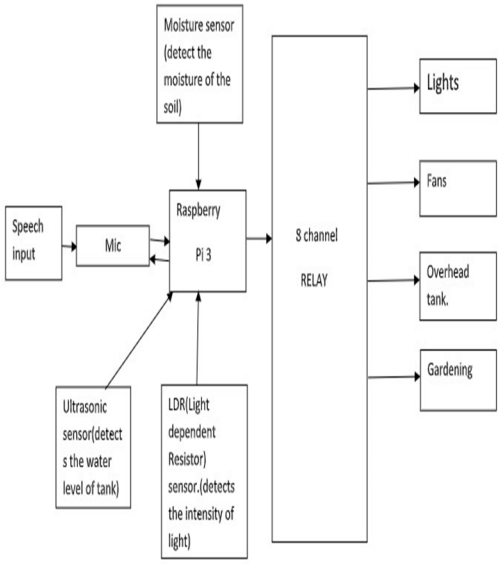


Fig 1. System Architecture

1) Raspberry Pi: The Raspberry Pi 3 Model B is a tiny credit card size computer that was designed in the UK by the Raspberry Pi Foundation. Originally intended to assist in teaching computer science, the Pi's accessible price makes it popular with hobbyists / makers / hackers who use it to create everything from Living Room PCs to Robotics Projects. Just add a keyboard, mouse, display, power supply, micro SD card with installed Linux Distribution and you'll have a fully-fledged computer that can run applications from word processors and spread sheets to games.

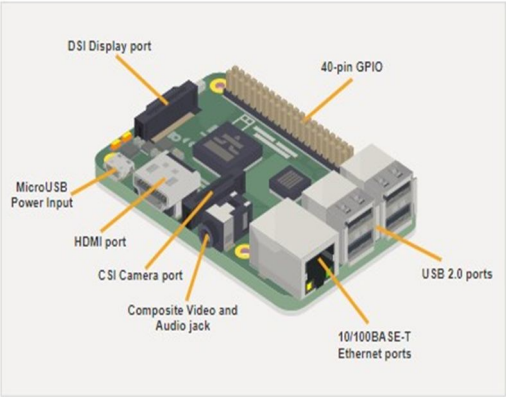


Fig.2 Raspberry Pi 3B

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2) *Moisture Sensor:* Moisture sensor measures the volumetric water content in soil. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighing of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of soil such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content.

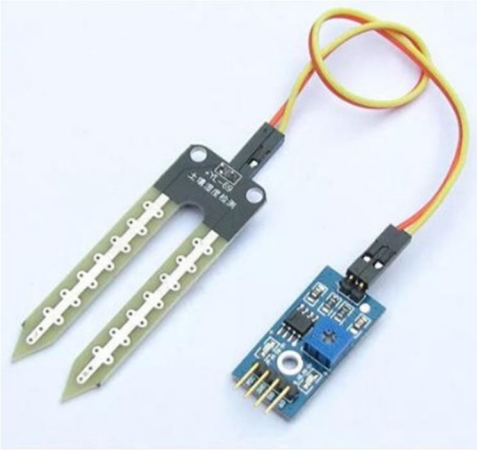


Fig.3 Moisture Sensor

3) *Ultrasonic Sensor:* An Ultrasonic sensor is used in the transmitter circuit, which measures the distance of water level from the upper point of the bottle or tank. The distance is measured in centimeters and sent to receiver circuit using RF communication.

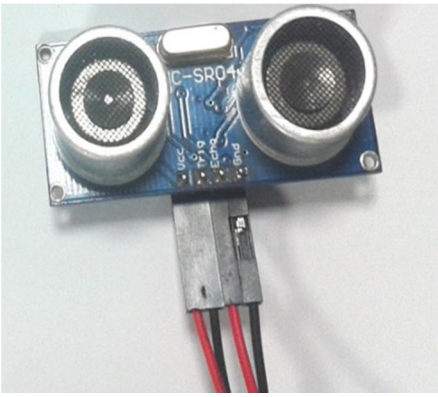


Fig.4 Ultrasonic Sensor

4) *LDR Sensor:* It is also known as photo resistor. Light Dependent Resistor (LDR) are low cost and simple structured. These resistors are frequently used as light sensors. These resistors are mainly used when there is a need to sense the absence and presence of light such as burglar alarm clock, light intensity meters, etc.

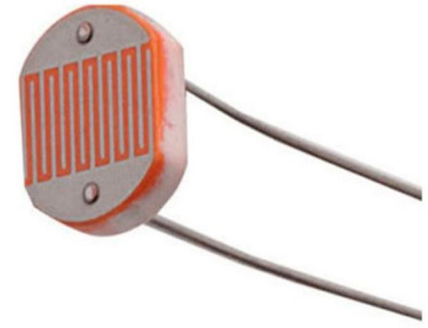


Fig.5 LDR Sensor

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5) *Relay Switch:* A 8 channel relay is used in this project .8 Channel Relay Board is a simple and convenient way to interface 8 relays for switching appliances in project.



Fig.6 Relay Switch

VI. FUTURE SCOPE

A. The system can be extended to automate the home appliances such as Television, refrigerator, solar heaters, Micro-Oven using few more sensors.

B. The System can be extended to implement "smart doors" in which the doorbell can be embedded and by using the voice and video between the users that is owner and the person who is standing right outside the door can communicate thus increasing the safety quotient of the system.

VII. CONCLUSION

The concept automating the appliances exists from decades but with the rapid advancement in technologies people's expectations keep increasing about what services can be adopted so that work can be done in few seconds. Thus the "IOT Based Voice Controlled System For Smart Applications" is implemented by using Raspberry Pi that automates the number of appliances through the use of voice or speech recognition capability and also using manual buttons in android application. There are many advantages of Raspberry Pi when compared to other devices such as It is robust, it has built-in Wi-Fi and Bluetooth module which is easy to configure and the ability to run multiple programs. The technology behind this is benefit for the mankind.

REFERENCES

[1] Ms. B. Selva Priya (department of EEE), Ms. R. Geethamani (department of EEE), "Design And Implementation Of Home Automation Using Power Electronic Switches", Sri Krishna college of Technology Coimbatore, Tamil Nadu , India-IJAICT Volume 2, Issue 12, April 2016.

[2] Himani Singh Dhami, Nidhi Chandra, Nishank Srivastava, Avinash Pandey "Raspberry Pi Home Automation Using Android Application" , PSIT Kanpur, India , IJARIIT, volume 3,Issue 2, 2017.

[3] Harshada Rajput, Karuna Sawant, Dipika Shetty, Punit Shukla, Prof.Amit Chougule "Voice Based Home Automation System Using Raspberry Pi", G.V. Acharya Institute of Engineering and Technology, Mumbai University, Mumbai, Maharashtra, India IRJET, Volume 05, Issue 04, April 2018.

[4] R. Sugantha Lakshmi, P. Karthika, A. Rajalakshmi3, M. Sathya "Smart-Home Automation Using IoT-Based Sensing and Monitoring Platform", Kings College of Engineering, Thanjavur, Tamil Nadu, India, IJSRCSEIT, Volume 5, Issue 1,2019.

[5] G.Shivaji rao, M.Bala Shanmugi, D.Pradeepa, V.Usha kamali,".G.Shivaji rao, 2.M.Bala Shanmugi, 3.D.Pradeepa, 4.V.Usha kamali", Sree Sowdambika College Of Engineering Aruppukottai, SSRG-IJCSE,2019.

[6] Ravi Kishore kodali and Vishal jain " IOT based smart security and Home Automation system" International conference computing, communication and automation (ICCCA 2016)

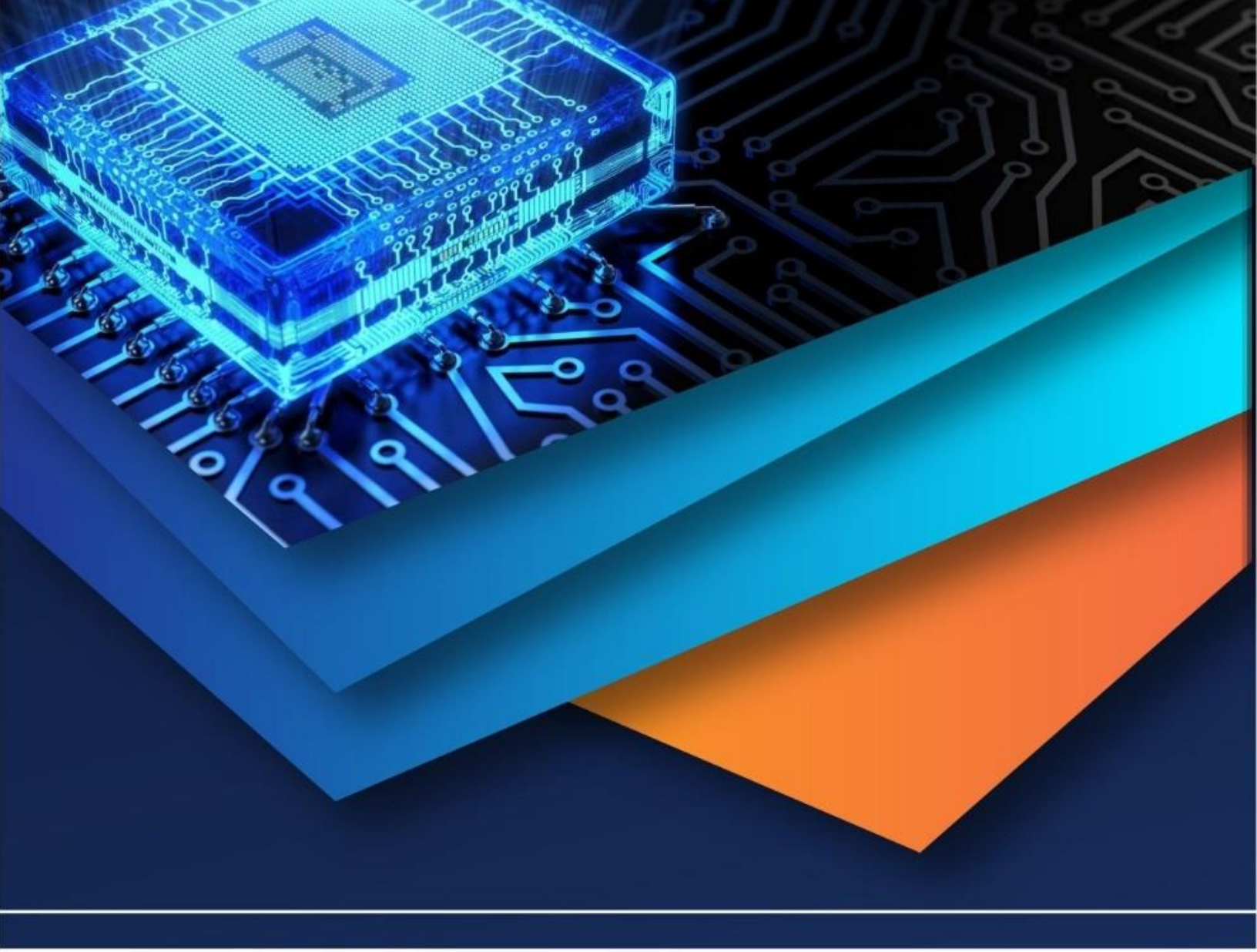
[7] Hari Charan Tadimeti, Manas Pulipati, "Overview of Automation Systems and Home Appliances Control using PC and Microcontroller", Volume 2 Issue 4, April 2013.

[8] A. ElShafee and K. A. Hamed, "Design and Implementation of a Wi-Fi Based Home Automation System, "World Academy of Science, Engineering and Technology, vol. 68, pp. 2177-2180, 2012.

[9] Sonali Sen , Shamik Chakrabarty , Raghav Toshniwal , Ankita Bhaumik," Design of an Intelligent Voice Controlled Home Automation System," Department of Computer Science St. Xavier's College, Kolkata international Journal of Computer Applications (0975 –8887) Volume 121 – No.15, July 2015.

[10] Saptarshi Bhowmik1, Sudipa Biswas 2, Karan Vishwakarma 3, Subhankar Chattoraj 4*, Parami Roy 5, "Home Automation System Using Android Application," Department of Computer Science Jadavpur University IBM India Research Associate ESL Technologies Research Associate ESL Technologies TCS, India. International Journal of Scientific and Research Publications, Volume 6, Issue 12, December 2016.

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