International Journal of Enhanced Research in Science, Technology & Engineering
ISSN: 2319-7463, Vol. 11 Issue 5, May-2022, Impact Factor: 7.957

Design and Development of Voice Operated Home Automation using Google Assistant

Suraj Sanjay Gavali[1], Hruthik Sudhakar Barmukh[2], Prawjal Rajendra More[3]

[1,2,3] Student PCET-NMIET, E & Tc Department, Sppu University

ABSTRACT

This report is mainly based on voice recognition wireless home automation, looking into the advancement in technology, focusing on home automation aspect we see that there is rapid growth in perfecting smart homes, why this project is important, integrating not only voice a secure biometric, as an activator but also incorporating a wireless connection between the voice recognition system and the home automation system, the project is also special in a way that voice recognition system can be as far as 1.1km from the home automation system to automate any appliance connected to it, both communicating wirelessly. The projection was brought to perfection as it is through series of programming, in depth researches, opinions from my supervisor and like minds (colleges), various evaluation processes. The basic for the project is the voice recognition module V3 is sending signals to the 1st transceiver serving as the transmitter then from it sending to the 2nd transceiver serving as the receiver then sending the Signal to the relay module for the automation of the bulb and socket representing the home appliances.

Keywords— ***home automation, Google cloud, Node MCU, Blynk, Google assistant***

INTRODUCTION

We live in a world which is rapid in advancements, through these advancements in fields like wireless communication and information technology it's now possible to integrate various aspects of smartness in a house. Now looking into comfort living and easy living, technology as made available various consumer electronic [home appliance] such as central air conditioned and heating, lighting systems and others, controlled by different units based on infra-red or just normal switch systems. On the other hand, voice recognition wireless home automation as created an avenue for real life voice command interaction between the consumer electronics [home appliance] and the consumers/users which is done wirelessly. Basically looking into the demography of the world's population we see 15-64 years of both male and female taking the most percentage of the population [65.9%], in this percentage are home owners, elderly, disabled etc. (Wikipedia, 2019) caring for and supporting the growing population is the major concern for the Governments worldwide, this home automation meets the needs of consumers looking for luxury, sophistication, and special needs so it's basically for everyone. This system majorly provides better control locally and remotely, improving usability and functionality of any home it's installed in enabling savings on cost and power. This project is generally changing the conventional methods of switching on/off of house hold appliance without necessarily being close to the appliance , with the use of transceivers [as far as 1.1km from the appliance] creating a wide range of connectivity between the user and the appliance wirelessly, a V3 voice recognition module [text dependent] which can comprehend about 80 Page | 2 commands for application, just to mention a few aids .the focus of this report is the detailed analysis of the design and prototype testing of home automation with voice recognition done wirelessly. The method adopted is the us e of two systems, one handling the voice recognition and sending the results wirelessly to the other system handling the home automation in which all steps and procedures to arrive at this is explained later on in the report including studies on the subject matter, importance of this project can't be over emphasized cause it's an avenue of making living more comfortable and not to a certain set but to all including people with special needs.

LITERATURE SURVEY

Manish Prakash Gupta (2018) has proposed "Home automation using voice via Google assistant. The spoken commands from Google assistant sends message to micro-controller this micro-controller pass the message to relay which will switch On and Off the appliances. Aayush Agarwal, Anshul Sharma, Asim Saket Samad and S Babeetha (2018) "UJALA- Home Automation System Using Google Assistant" This project presents a design and prototype of Home Automation system that will use ESP8266 Wi-Fi module as a network provider in connecting with other

appliances. Further we will connect the specific home to our database and it can be accessed from anywhere through a specific IP address or website. Also, an app would be developed which will allow the user to control their devices using the Google Assistant. Md Sarwar Kamal in (2017) "Efficient low cost supervisory system for Internet of Things enabled smart home." This paper proposes an efficient low cost supervisory system for smart home automation that can be managed using IoT. The proposed system is based on Apriority algorithm and will help to monitor and control all the home appliances and electronic devices through a supervisory system in a most efficient and reliable manner. Both the consumers and the suppliers will get the opportunity to manage the power distribution by monitoring the electricity consumption. Nikhil Singh, Shambhu Shankar Bharti, Rupal Singh, Dushyant Kumar Singh (2014)"Remotely controlled home automation system", Advances in Engineering and Technology Research (ICAETR) This paper describes an investigation into the potential for remote controlled operation of home automation systems.

It considers problems with their implementation, discusses possible solutions through various network technologies and indicates how to optimize the use of such systems. The home is an eternal, heterogeneous, distributed computing environment (Greaves, 2002) which certainly requires a careful study before developing any suitable Home Automation System (HAS) that will accomplish its requirements. Nevertheless, the latest attempts at introducing Home Automation Systems in actual homes for all kinds of users are starting to be successful thanks to the continuous standardization process that is lowering the prices and making devices more useful and easier to use for the end user. Even so several important issues are always to be handled strictly before developing and installing a Home Automation System; factors like security, reliability, usefulness, robustness and price are critical to determine if the final product will accomplish the expected requirements.

OBJECTIVES

This project is designed to use the voice recognition technology to control home utilities i.e. light and fan

- Its implementation especially focuses on the needs of disabled people.
- Google voice recognition facility will be utilised to input voice.
- Android phone will be used for the application software which will be connected to the google voice command input.
- Application software will be responsible for converting the voice command into the text format.

METHODOLOGY

The system design is broken down into two main categories,
• The hardware- It has the capability to connect to the router. It would also be able to turn on/off specified devices, such as lights and fans. It is called the 'Control Unit'. And,
• The Software- the Blynk app, the IFTTT app and the Google Assistant constitute the software of the design and these applications would be integrated in the Android device.

The Control Unit comprises of the microcontroller- NodeMCU and the 4/8 Channel Relay board. Relay board uses Node MCU(ESP 8266) to control the relays. The Blynk app on an Android device communicates with the microcontroller and sends the desired signal via the internet. Figure 1 below shows the basic system design architecture.

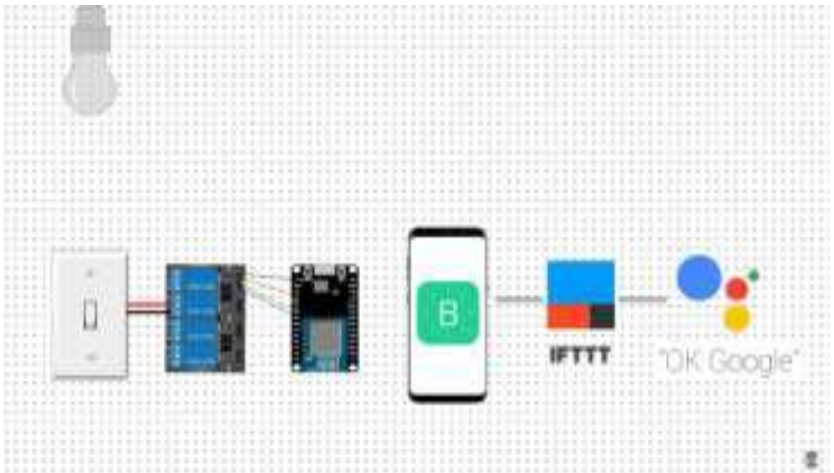

Fig -1: Basic System Architecture

The hardware also called the Control Unit comprises of the NodeMCU microcontroller and the Relay board. NodeMCU's digital output pins are connected to the Relay pins of the Relay board. Finally, each Relay is connected to an appliance. In the fig- 1 above the second relay is connected to a bulb.

CONCLUSIONS

In this project, voice commands are given to the Google assistant. The voice commands for Google assistant have been added through IFTTT website and the Blynk account is also linked to it. In this home automation, user has given commands to the Google assistant. Home appliances like Bulb, Fan and Motor etc., are controlled according to the given commands. The commands given through the Google assistant are decoded and then sent to the microcontroller and it controls the relays. The device connected to the respective relay turned ON or OFF as per the users request to the Google Assistant. The microcontroller used is NodeMCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet). There has been tremendous growth in the home automation sector, and many reputed companies utilizing their opportunity to work with IFTTT to deliver an elegant way to connect families to their homes.

Consumers are looking to secure their home environment in today's unpredictable world, and the new Home automation service gives them the peace of mind that they need to protect their family's well-being. This project is about wireless home automation using Android mobile helps us to implement such a fantastic system in our home at a very reasonable price using cost-effective devices. Thus, it overcomes many problems like costs, inflexibility, security etc. In addition, will provide greater advantages like it decrease our energy costs, it improves home security. In addition, it is very convenient to use and will improve the comfort of our home. The project has proposed the idea of smart homes that can support a lot of home automation systems. Node microcontrollers have been used to connect the sensors circuit to the home

FUTURE SCOPE

Future scope for the home automation systems involves making homes even smarter. More energy can be conserved by ensuring occupation of the house before turning on devices and turning off lights if not necessary. The system can be integrated closely with home security solutions to allow greater control and safety for home owners. The next step would be to extend this system to automate a large scale environment, such as offices and factories. Home Automation offers a global standard for interoperable products. Standardization enables smart homes that can control appliances, lighting, environment, energy management and security as well as the expandability to connect with other networks. Well, no system is ever perfect. It always has a scope for improvement. One just needs to put on a thinking cap and try and make the system more better.

ACKNOWLEDGMENT

The heading of the Acknowledgment section and the References section must not be numbered.

Causal Productions wishes to acknowledge Michael Shell and other contributors for developing and maintaining the IEEE LaTeX style files which have been used in the preparation of this template. To see the list of contributors, please refer to the top of file IEEETran.cls in the IEEE LaTeX distribution.

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