



DESIGN OF SMART HOME IMPLEMENTATION WITH NATURAL LANGUAGE INTERFACE

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ABSTRACT

Voice Controlled Home Automation Using Arduino is an exciting project that aims to automate home appliances with the power of voice commands. In this project, voice instructions will be recognized, and text-to-speech conversion will be performed using an Android app. The HC-05 module which is connected to Arduino through UART interface will be used to transmit the text data via Bluetooth to an Arduino microcontroller. This system is very practical and user friendly because it enables users to simply control and manage home appliances using basic voice commands. This idea offers a new degree of automation and efficiency in managing home appliances thanks to the integration of modern technology.

Users can control loads through voice commands. Here voice app converts voice commands into text format. This data is transmitted to Arduino via Bluetooth. According to voice commands loads will be ON and OFF. Here voice commands are “light ON”, “light OFF”, “fan ON” and “fan OFF”

Keywords: HC-05 Bluetooth module, Arduino UNO, Commands are “light ON”, “light OFF”, “fan ON” and “fan OFF”.

I. Introduction

Home automation is a concept that began in the late 1970s. However, as technology and smart services have advanced, people’s expectations have also changed over time, challenging people to imagine the ideal smart home and to define what a home must do or how services should be accessed and provided inside. This shift has also affected the concept of home automation systems. Home automation permits controlling house appliances like door, light, fan, oven etc. It jointly provides an associate emergency system and residential security. It allows the consumer additional control of his home it facilitates several conditions, as an example, if the consumer is permit to on his home appliance to controlled light, fan or any other load, or pre-heating kitchen appliance once he got home, therefore, several manual actions is replaced by home automation that reduces human efforts and time-saving. During paper, new styles and totally different home appliances are given. Many different electric applications are controlled by using Arduino UNO

Microcontroller Based Home Automation System.

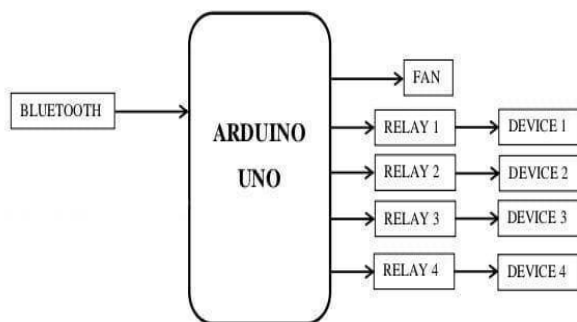
The system is used to bulb using a smart phone application with Bluetooth wireless technology. As a result of all its advantages, home automation is growing in popularity.

II. Existing System

The existing systems use a Microcontroller and PC to control the home appliances. In this system a PC connected to a microcontroller through a level shifter IC, ULN2003 (Driver) is used to drive the relays. DB9 (RS-232) connector is used to connect to PC com port. In this system the devices are controlled by the PC. Here comes the issue that the person cannot sit in a place continuously. The drawbacks of this system are: No internet access for long distance communication and always needing a PC connectivity. So, to overcome this a wireless device or system must be implemented.

III. Proposed System

As a proposed system, the main objective of this system is to overcome the drawbacks that are being faced in the existing system. This system uses Arduino UNO and Bluetooth module to control the home appliances. In this system all the devices are controlled by voice, here we are using AMR_Voice app to control the home applications. This system is very useful for older people and handicapped people.



INPUT

OUTPUT

Fig 1 Block diagram

IV METHODOLOGY

This system is used to control all the appliances that are connected to the microcontroller. The methodology of the proposed system is mainly divided into three steps. In the initial step an Android application interfaces with the Bluetooth module. After that within the second step, the microcontroller receives the signal that has been caused by the Bluetooth module. Then the microcontroller sends the activation signal to the relay module. In the last step the relay module switches the devices that are connected to the relay.

V. Working

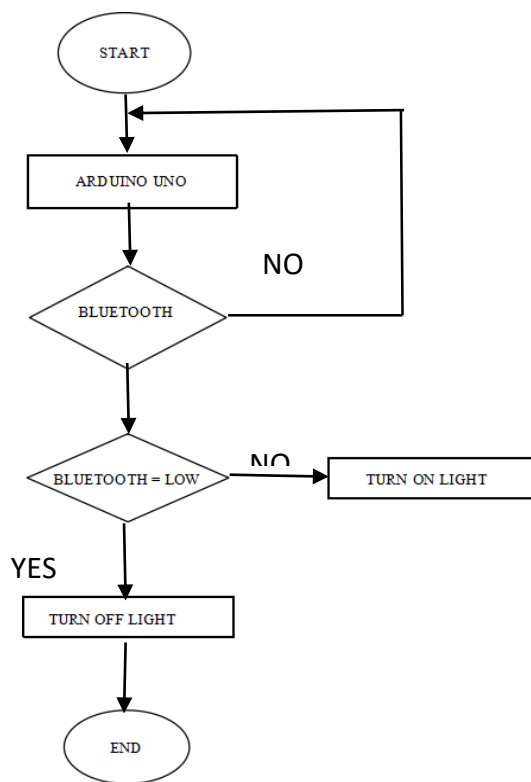
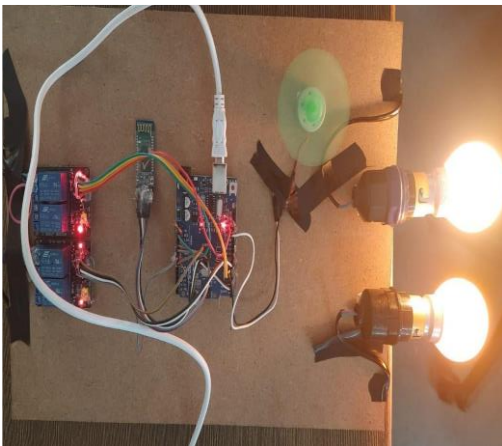


Fig 2 Flow chart

The Voice Control Home Automation project operated by a free application known as “ARDUINO BLUETOOTH CONTROLLER”. This application operates the various appliances attached to our Arduino UNO and relays. Once the toggle switch on the application is pressed, corresponding Bluetooth signals transfer data from

our android cell phone to the Bluetooth module we've attached to our Arduino. The Arduino finds out that the signal was sent and compares it to the predefined signals appointed for every appliance. Once it recognizes that signal, the Arduino turns on the relay connected to its digital pin by carrying out 5V through it. Thus, the relay is turned on and the similar appliance connected to the relay is turned on exactly the same way. To turn it OFF, Arduino UNO transfers 0V or logic low to its digital pin.

VI. RESULTS



Advantages:

- It is very easy to use.
- No additional coaching is needed for using it.
- All the control would be in your hands by using this voice control home automation system.
- This project will give the ability to observe all the appliances within the communication limit through Bluetooth.
- By using this method, the users will check the standing of the appliances no matter the time of the day.

Disadvantages:

- Bluetooth technology utilizes this home automation system, which has a range of ten to twenty meters so the control cannot be achieved from outside this compass.
- Application is connected after disconnecting the Bluetooth.
- If we use voice technology off time, we could experience some physical discomfort and vocal issues.

Applications:

- Applications are using remote controls.
- This project was used as a security system in applications like homes, hostels, industries.
- We are used to being lazy and creative; the automation system works for us.

- For safety from the main line plug-in, out.
- Children do not get any electric shock.
- Protection from all kinds of human hazards.

VII. Conclusion

This project is a microcontroller based mostly project. A Voice Control Home Automation system is extremely effective during this time. During this project we wish to execute the system to be used in varied places like home appliances, industrial automation etc. A Bluetooth module receives data through Android apps like "home automation". The data of the Bluetooth module is delivered to the Arduino UNO board. Arduino UNO controls the switches of relay modules. All the loads are connected to the relay. We have finally succeeded in creating the "Voice Control Home Automation" Satisfactorily. More information is gained, and a lot of experiences are faced. A lot of information is collected ultimately; we've concluded with excellent pleasure for achieving our aim. We've planned to follow until the end of our career.

VIII. Future Scope

This monitoring system will be increased by using Bluetooth, which supports another period application. For industrial purposes, a mobile robot can be developed for automation. Within the future, all the devices that we tend to use on a daily basis that are connected to a microcontroller {and we tend to and that we} shall use them wirelessly not only Bluetooth control however conjointly we use approaching technologies. Within the coming back generation use of mechanical parts and advanced alarm, the method will be more useful for utilization.

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