Smart Home Automation System

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Abstract

Automation plays a major role in modern technological development. This system mainly focuses on controlling fans and lights through voice commands. Normally home appliances are controlled by manual switches and one needs to walk to the switching board to control it. The main problem is that physically challenged people face difficulty in operating. To help physically challenged and elderly people, a smart home automation system is designed to control electricaldevices such as fans and lights with the help of Arduino, relays, Bluetooth, etc. The introductionof speech recognition in our project greatly improves there usability and functionality of any modern home.

1.INTRODUCTION

In the field of communication networks, where the Smart Home systems are some what different from ordinary homes, which allow the devices to communicate each other. The performance of the home is monitored and controlled with the help of smart devices. The facilities available in today's modern home greatly supports the occupants by the application of an integrated communication system[1-3]. The coolants like air-conditioning system and other various heating devices are being installed in most homes that makes the life simpler and also flexible to use. The use of fire and security alarms greatly helps in security systems The use of home heater, television is widely increasing nowadays so that the value of smart devices increasing day to day[4-5]. These are the systems which is usually detached from each other. It provides the facility of providing data to the user and also the commands which is instructed. It supports special needs both locally and remotely, particularly services that support the elderly. The convenience and functionality are greatly improved through the smart home technology of any home. It allows saving money and also economically stable

1.1. PROBLEM STATEMENT

The problem identified in the existing system is, one should have to walk to the switch board to tap the corresponding device on or off. With the advancement in technological development, this manual method takes some time to accomplish a process. Physically challenged people faces difficulty in operating. To overcome this problem, voice commands are given as input to the application which is installed in the phone and the corresponding device is switched based on the inputs given by the user.

1.2. OBJECTIVES

The main objective of this paper is, it helps in controlling the electrical appliances through voice commands given by the user. With the help of the proteus software, this action is achieved. The main component used in these projects are Arduino uno which is used for controlling the relay through which the appliance is switched on or off. To help physically challenged people by reducing their mobility, an effective voice-controlled technique is designed.

2. METHODOLOGY

The working methodology of proposed work is shown in Fig 1

Fig 1. GUI of the proposed work

The ArduinoUnoR3 is a circuit board with a built in type of ATmega328,and it has 14digital input and output pins (The PWM output pins are connected to the 6 pins of the Arduino and the remaining 6 pins are analogue).It also has USB connecting port, a power jack,and reset button.

In the block diagram, the power supply and HC-05 Blue tooth are directly connected to the Arduino. The power supply of 5V is given to it. Also, the LED and relays are connected to the ArduinoUnor3. The proposed solution is automatically controlling the fan and lights.
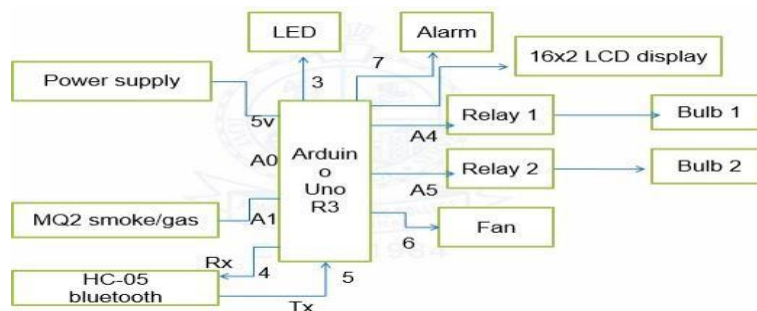

Fig 2. Block diagram of the proposed work

The smart devices enable the use of an android based Bluetooth application. The main components of this system are Arduino Uno for controlling the automation and Relay for acting as a switch. The voice control application is installed on android phone devices[5-6]. The application on the android phone improves the usability of the device using an android software development kit. By tapping the micro phone button on the app, the voice command is given as input and the corresponding device is switched on or off. The voice commands given by the user is converted to the text. The Bluetooth module on the Arduino Uno board is configured to send the text which helps in controlling the electrical appliances by relay control.

3.RESULT AND DISCUSSION

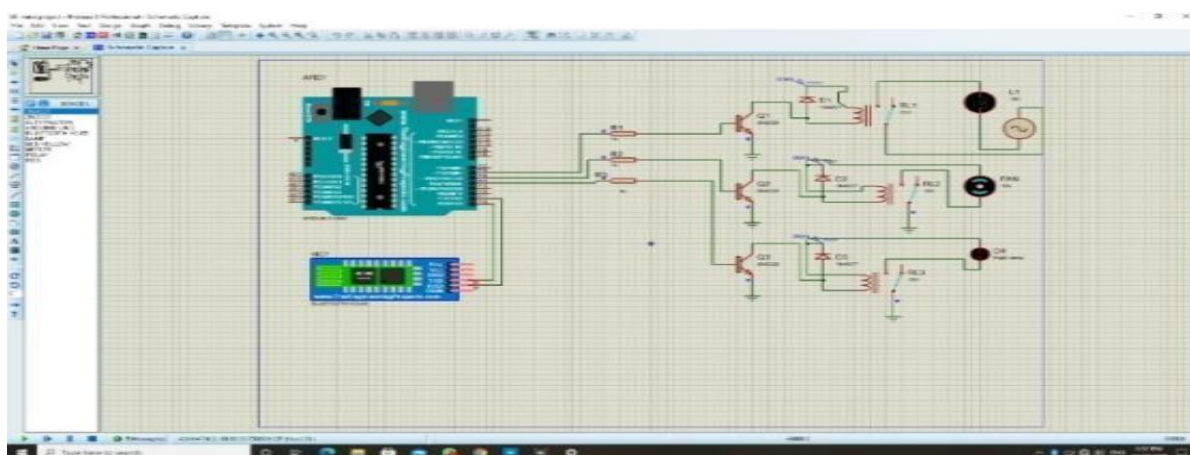The output of the proposed work of the Simulation program is shown in Fig 3

Fig3. Simulation diagram of the proposed work

The smart home automation system is done successfully through voice control. The device will be user-friendly. Reducing human effort and errors and thus increasing efficiency.It results in time-saving. It is feasible and easy to use.

Table 1:Voice Controller Action

S.NO	VOICE COMMAND	ACTION
1	L1 ON/OFF	Light 1 is on or off
2	L2 ON/OFF	Light 2 is on or off
3	F1 ON/OFF	Fan 1 is on or off
4	TV ON/OFF	Tv is on or off
5	AC ON/OFF	AC is on or off

ADVANTAGES:

It is convenient to use and also easy to operate. There is no barrier for ageing persons in operating the device. It saves more time as this device runs automatically. It retains some energy compared to the manual method. The device is low cost in nature and also economically stable.

APPLICATIONS:

These devices are used in various applications, it plays a major role in natural language-based voice assistants. It also improves home safety and security systems. This type of device is greatly used in luminescence control.

5. CONCLUSION

In this paper, the aim is on developing a smart home automation system with the backbone of Arduino. It controls the home electronic devices by use of voice control. The implementation of the system was simple and flexible in nature. Moreover, this technique is better than other home automation methods in several ways. This proposed system provides many advantages including safety, security, energy and cost saving.In future many more features can be added in it like home appliances can be automatically monitorby implemented more and efficient techniques

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