

Home Automation through Voice Recognition

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Abstract— The main objective of this project is to develop a home automation system using an Arduino board with Bluetooth being remotely controlled by any Android OS smart phone. As technology is advancing, modern houses are getting smarter. Modern houses are gradually shifting from conventional switches to centralized control system, involving remote controlled switches. Presently, conventional wall switches located in different parts of the house make it difficult for the user to go near them to operate. Even more it becomes more difficult for the elderly or physically handicapped people to implement. Remote controlled home automation system provides a most modern solution with smartphones. In order to achieve this, a Bluetooth module is interfaced to the Arduino board at the receiver end while on the transmitter end, a GUI application on the cell phone sends ON/OFF commands to the receiver where loads are connected. Touching the specified location on the GUI, the loads can be turned ON/OFF remotely through this technology. The loads are operated by Arduino board through opto- isolators and thyristors using triacs.

Keywords: Home Automation, Voice Recognition



Fig. 2:

Voice Control Smart Home Automation project is implemented and tested. The hardware components of this system consist of 'Android' phone, Arduino mega, HC-05 Bluetooth module, four channel relay module and four different color bulbs. Each bulb indicates a single home appliance and microcontroller is programmed in such a way in which it is able to control all four loads. These Appliances consist of LED, TV, fan and compact fluorescent lamp (CFL). The wireless communication between android phone and Arduino mega is performed via Bluetooth technology. The software part of this project consists of AMR_voice app which converts voice command to text command and integrated development environment (IDE). Android OS has a voice recognizing feature that is used to develop a smartphone application which is able to control the home appliances from user voice command [4]. AMR_voice app converts the user voice command into text command, and then it transmits text command to the Arduino mega via HC-05 'Bluetooth' module which is interfaced to the microcontroller. One of the benefits of this system is that the user only need to pronounce the home appliances name to the AMR_voice app, for example telling it "LED ON or LED OFF", in this way the user can control home appliances

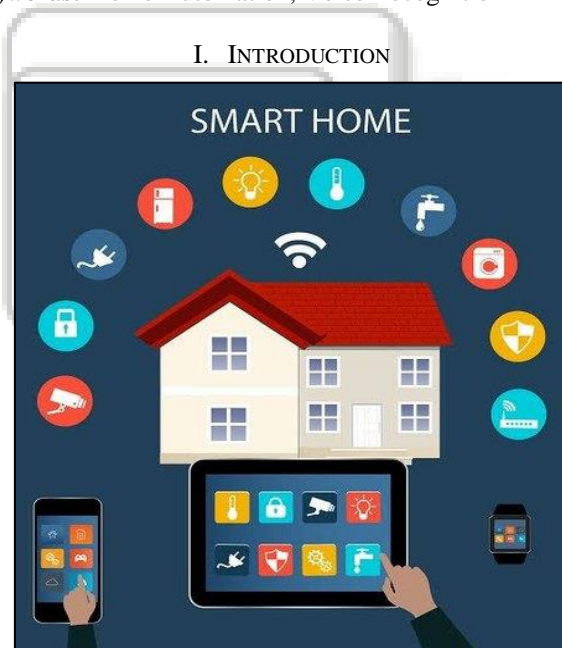


Fig. 1:

There is an increasing demand of smart homes, where appliances react automatically to changing environmental conditions and can be easily controlled through one common device.

This paper presents a possible solution whereby the user controls devices by employing a central Field Programmable Gate Array (FPGA), where control is communicated to the FPGA from a mobile phone through its Bluetooth interface.

II. SCOPE OF HOME AUTOMATION

The voice recognition application can be improved with increasing the accuracy of voice recognition. It can help user for controlling home appliances with more comfort. The Bluetooth and GSM communication module can also be replaced with Wi-Fi or Ethernet shield as Bluetooth has some limitations such as a shorter range and lower bandwidth than Wi-Fi. Wi-Fi does not have distance problem and it can make connectivity between devices in our home more reliable than other wireless alternatives. In addition, Wi-Fi has the ability to broadcast continually and more secured than Bluetooth.



Fig. 3:

III. ADVANTAGES OF HOME AUTOMATION THROUGH VOICE RECOGNITION

- 1) The main advantage of “Home Automation through Android Mobile” is for the “Physically Challenged and immobilized People”.
- 2) Provides Centralized control of home system via smart phones.
- 3) Helps to enjoy complete Security.
- 4) Provides portability anywhere and anytime.
- 5) Helps in the Enhancement of lifestyle.

IV. BLOCK DIAGRAM

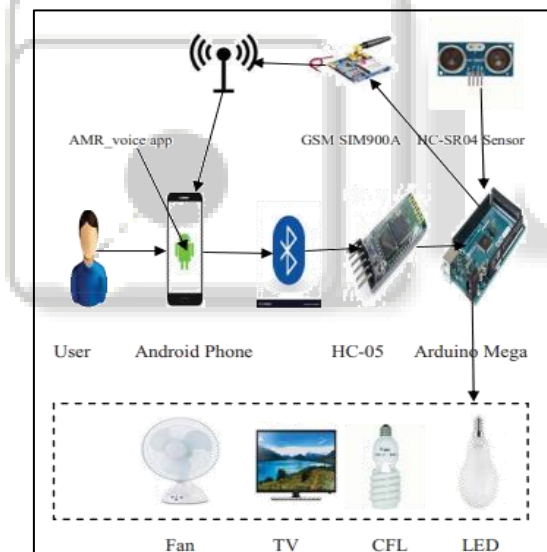


Fig. 4: Overall System Design

V. OBJECTIVE

The main objective of home automation and security is to help people including handicapped and old aged which will enable them to control home appliances and alert them in critical situations. Voice recognition system helps to control home appliances using a voice controlled android application.

VI. CONCLUSION

The voice control and home security smart home automation system is implemented and tested successfully. The voice control part of this system works well in the range of 20m as it is the range of HC-05 Bluetooth module. In order to increase home security HCSR04 ultrasonic sensor is used to

detect the movement and send message to the user phone via GSM SIM 900A. The purpose of the system was to control four home appliances such as TV, LED, fan and CFL using voice and it is achieved successfully. This system was targeted for elderly, disabled and for convenience of remotely controlling home appliances without reaching for manual switches. Hence, this system is very useful for everyone, particularly for elderly and physically disabled persons who are in need of a physical assistance for their daily needs. In addition, this proposed system has the ability to detect the object and transmits to the user mobile, which it can increase the user home security. Finally, the project is achieved in controlling four home appliances for example TV, LED, CFL and fan, at the same time to detect the object and transmit to user mobile. Therefore, the prototype of this system is portable, reliable and ready to install in the house. To conclude with, the project has achieved its objectives and scope.



Fig. 5: Voice Controlled Home Automation System

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