Voice Recognition Smart Home Automation Using ZIGBEE and Android

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Abstract— As seen in recent year's home automation is gaining importance due to use of various wireless technologies. Home automation provides security and comfort mainly for old age people and physically handicap humans. This paper combines various technology for home automation such as voice controlled, Android, Bluetooth and ZIGBEE, which makes it more user friendly. The low cost Bluetooth technology follows IEEE 802.15.1 standard protocol which is open standard technology for implementation of short range wireless communication. Android is a Linux based core open source operating system mainly used in portable devices. ZIGBEE is an IEEE 802.15.4 standard device for applications that require low data rate, long battery life and secure networking.

Keywords- *Voice recognition, Android, Bluetooth, Atmega 328P , Zigbee.*

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I. INTRODUCTION

Numerous wireless communication standards were developed and executed during past decade. GSM, Wireless Fidelity and Bluetooth are well-known by most people in the present world. These standards have occupied our daily routine with outstanding popularity. Home automation is not new perception in today's era, home automation used to provide user approachability for user to remotely control the appliances with ease and it provides the greatest use of electricity. The appropriate use of electricity makes the home automation to play an important role in our daily life. With the continuous increase in smart phone users, they have turned into an all-purpose portable device which helps people for their daily minor activities. A low cost, wireless voice recognised smart home system for controlling the home environment is used in this paper.

This system will help users to have control on each appliance in their home with their voice. All that a user needs is an Android smartphone, and a control circuit. This paper consists of ZIGBEE, a microcontroller, which processes the user commands and controls the devices. The connection between the microcontroller and the smartphone is built via Bluetooth.

II. NEED OF SYSTEM

The various systems available around the globe are made either using only android or only using ZIGBEE, where one offers compatibility and the other offers long distance. This system consists of both ZIGBEE as well as android which make the system user compatible and serves over a longer distance.

III. OBJECTIVE OF THE SYSTEM

The main objective of the system is to serve the people who cannot work independently and rely on others to help them out such old age and handicap persons can use this system and manage their daily routine independently which will indirectly provide them happiness

IV. LITERATURE SURVEY

The available systems in the market are either made from ZIGBEE or are made using Android.

The system made using only android applications are compatible applications but are not distance friendly.the range of bluetooth is only 30 meters hence this system can be operated using android device within the bluetooth range.

One of the paper that I referred was by S. Anita, S. Jothi "Implementation of Android Voice Recognition for Smart Home Application Using Bluetooth" International Journal of Innovative Science and Modern Engineering (IJISME) ISSN: 2319-6386, Volume-3 Issue-5, April 2015

The system constructed uing only ZIGBEE are used to provide long distance communication between two devices but this system us not more user friendly because the user needs to get up and walk to the transmitter setion and then ive the commands.

The paper that used ZIGBEE was by Dhawan S. Thakur And Aditi Sharma "Voice Recognition Wireless Home Automation System Based On Zigbee"IOSR Journal Of Electronics And Communication Engineering Volume 6, Issue 1(May. - Jun. 2013), PP 65-75.

V. PROPOSED SYSTEM

This section consists various technologies used for developing voice controlled smart home automation using

ZIGBEE. The Voice controlled application presented in this paper is based on the following technologies: ZIGBEE, Android, and Bluetooth. Android is an emerging platform used for developing and organizing android based applications on mobile devices supporting it. Bluetooth has its own level/standard for wireless communication technologies for short range communication provide a facility to create Android based mobile applications. ZIGBEE is a technology based on wireless standards which was developed by ZIGBEE Alliance in 1990s and it is an open global standard technology to address the distinctive needs of low power, low cost, wireless networks

The complete system is divided into two sections 1. The transmitter section

2. The receiver section

A. Transmitter section

This section relies upon +12V of supply which is used to control all the circuit elements of this section. The main signal received by this section are from an android application named "Android Meets Robot" which is directly connected to the HC-06 bluetooth module via serial communication. As soon as the module receives signal it transfers the data to the microcontroller Atmega 328P.The microcontroller checks for the appropriate input as required and forwards the signal to the ZIGBEE. The main purpose of ZIGBEE is to transmit the signals received from microcontroller.

Figure 1.   Implemented Transmitter Section
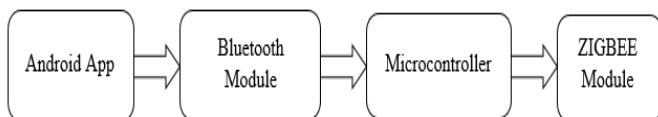
B. Receiver Section

The receiver section consists of a +12V power supply, ZIGBEE, microcontroller, relay driver, a few relays & 16X2 LCD. As soon as the ZIGBEE receives signals, it delivers the same to the microcontroller. Microcontroller processes the signal, through which it controls the relay driver and the LCD. Microcontroller compares the alphabets spoken and accordingly provides the output which is then received by the driver IC and the same command is displayed on LCD. The driver IC controls the relay operation as per the inputs from the controller and simultaneously displays the output i.e controls the 230V loads connected to the relays.
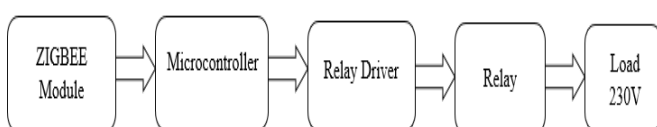

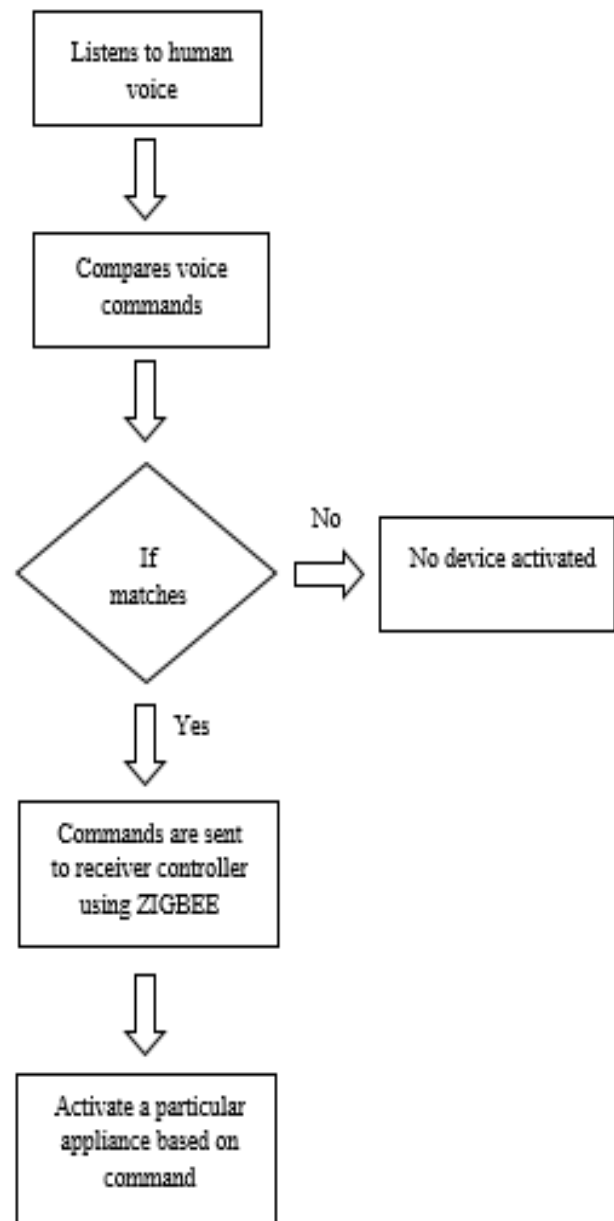Figure 2.   Implemented Receiver Section

VI.   SYSTEM DATA FLOW

Figure 3.   Data Flow For The Proposed System

Voice commands are the basic input for the system to work. These commands are provided to the system using an android application. The android application forwards the command to the Bluetooth module using serial communication. This command is then forwarded to the receiver section using ZIGBEE module. As per the command the microcontroller activates the relay driver and so are the appliances controlled.

VII.   CONCLUSION

This system will provide user friendliness as well as long distance communication. By the use of android application the user can operate devices without moving from his place and can operate devices in the range of approximate 300m because

of the use of ZIGBEE. This project will act as a personal robot for the basic activities of handicap and old peoples.

REFERENCES

[1] Dhawan S. Thakur and Aditi Sharma, "Voice Recognition Wireless Home Automation System Based on ZIGBEE" IOSR journal of electronics and communication engineering (IOSR-JECE) volume 6, issue 1 (may. - jun. 2013), PP 65-75.

[2] S. Anita, S. Jothi, "Implementation Of Android Voice Recognition For Smart Home Application Using Bluetooth" International Journal Of Innovative Science And Modern Engineering (IJISME) ISSN: 2319-6386, volume-3 issue-5, April 2015.

[3] Prashant R. Chandre And Aarti R. Salunke, "Home Automation Using Android Application & Bluetooth" International Journal On Recent And innovation Trends In Computing And communication ISSN: 2321 – 8169, Volume: 3 Issue: 2 (February 2015) , PP 815 – 819.

[4] Aniket Yeole, Sapana Bramhankar, Arjun Gaikwad, Abhijeet Bansod, Atul Borade, "RTOS Based Home Automation System Using ATMEGA" International Journal Of Innovative Research In Computer And Communication Engineering vol. 3, Issue 2, February 2015.

[5] B. Muniswamy Naik, B. Vamsi Krishn , "Speech Recognition Module For Home Automation System Based On Zigbee" Research Article, International Journal Of Computer Science And Mobile Computing, *IJCSMC, Vol. 3, Issue. 8, August 2014, Pg.737 – 74.*

[6] Parameshachari B D, Sawan Kumar Gopy, Gooneshwaree Hurry, Tulsirai T. Gopaul, "A Study On Smart Home Control System Through Speech" *International Journal Of Computer Applications (0975 – 8887) Volume 69– No.19, May 2013.*

[7] Sonali Sen, Shamik Chakrabarty, Raghav Toshniwal, Ankita Bhaumik, " Design Of An Intelligent Voice Controlled Home Automation System ", *International Journal Of Computer Applications (0975 – 8887) Volume 121 – No.15, July 2015.*

[8] Suraj Bhatia, Jatin Bajaj, M. Mani Roja , "Technology, Systems And Implementation Of A Smart Home Automation System: A Review", Suraj Bhatia Et Al, Int.J.Computer Technology & Applications,vol 5 (5),1690-1695

[9] Pankaj Jadhav ,Amit Chaudhari , Swapnil Vavale" Home Automation using ZigBee Protocol" (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 5 (2) , 2014, 1778-17