Intelligent Home Automation System Using BitVoicer

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Abstract

Home automation system (HAS) finds its applications and become popular worldwide now a days. It makes the life easier and flexible and also guarantees a security to the user. HAS has the capability to control the home appliances such as fans, light etc. That is operated at 230 V A.C. These appliances can be controlled through a simple voice command. HAS gives the feedback to the user and hence a virtual environment has been created between them. This virtual environment feels to the user and he is talking to the other person. This concept is not popular in developing nations as compared to the developed because of its cost. This is decision based interactive system so these are heavily coded. The proposed methodology gives the VCHAS based on ZigBee and Wi-Fi network both are incorporated through a joint gateway. The attempt to control the appliances without any physical efforts by the user makes the approach more dependable, friendly and interactive, makes it more authentic and realistic in nature.

Keywords: Home Automation; BitVoicer; Zigbee; Wifi; Home appliances.

I. Introduction

Now a days, Home Automation system (HAS) is applied in our daily life activities. In many ways, HAS has verified itself as most long driven used appliance and having an algorithmic based procedure. Many developments has been made for the past few years. Around 70 years back, wired based appliances were used but in 1985, HAS was first launched and after time to time many changes from the previous ones was notified. This gives the way to be used in home appliances currently. A shrewd home is not the one which is beautifully architectured or has a big area having all equipments in it, rather the one which has the smart technology like HAS in it. This makes the home savoir-faire.

Many other technologies were made in the past before this. People relied on manual work rather than programming. Stanford University thought of some technology for the first time but they crackled [I][II][III].

A lot of developments has been made and many business sectors are working on different types of hardwares leading to the HAS innovations. Many big brands claims their useful attempts in the field of home automation. But still a lot of space is
required to fill it up in that field. This field has a lot of potentials as compared to the mobile communication. With the inauguration of this technique, will bring the comforts in the people’s lives. This is the start of new era of automated things used in homes and offices. That will give a huge easiness with the little efforts [IV][V][VI].

II. Literature Review

It consists of different components containing voice recognized system, control blocks, remote unit and application and home apparatus. ASR works on computer based interpreted language that gives a permission to understand the spoken words ad changed into words in writing. ASR comprises of elements having an amplifier, software for recognition and computer. Whatever the user speaks is captured by the computer and convert it into writing and showed on the monitor [VII][VIII].

To check and control the HAS basic programming has been used for the project. This project starts by introducing the accessible comports that has been arranged. A dropdown comes into combo box to show the com ports that depends serial ports which links with the computer. To make the connection of one com port with the computer only one port is used. Once the execution starts, timer begin to synchronise and alternatively when the com port is selected, serial port is unlocked by tapping the interface catch to utilize the equipment [IX].

III. System Architecture

This suggested system is based arduino which is less in cost and efficient in power suggest HAS through voice measured in bits. It dynamically controls the devices using a voice command and also reduce the interaction of user with the system. It consist of three components: smart environment disclosure of segments, Smart server connected homes and voice command segments based of voice. These components will help to turn on and off different home appliances automatically. The below mentioned figure will give the details of these segments.

Fig.1. Home Automation Framework
IV. Kit of Sensors

The component composed of two sensing units, Light dependent resistor determines the intensity of light in the room (LDR) where as DHT Digital Humidity and Temperature checks the current temperature and gives back the value Temperature and humidity.

IV.a. Light Dependent Resistor sensor:

![Fig.2. LCD Sensor](image1)

LDR finds the light intensity with the help of a high resistance semiconductor. It will have a huge resistance up to mega ohms in the dark and show a less resistance to few hundred ohms in the day time. If the certain frequency exceeds when the light falls on the photo resistor, electron gets enough energy to fall into the conduction band. Lowering the resistance helping the free electrons to conduct electricity. So, in that case LDR transmits less signal to arduino controller.

IV.b. Digital Humidity and Temperature Sensor:

![Fig.4. DHT Sensor](image2)

It is a vital, digitalized temperature and humidity sensor includes the thermistor in it to measure the air and sends the data on the pins. It is very easy to use but handled carefully to send the data on the pins.

V. Actuator /LED

Whenever a user convey any message or command it is activated and shows the output. Different types of actuators are used for different devices like fan, lights and
Air conditioner etc. As arduino is a low powering device so LED is used as an actuator as it utilize less power.

VI. Server and Ethernet shield

It provides the arduino to coordinate through the internet. Wiznet W1500 ethernet chip is utilized for it. It provides the network for TCP and UDP. When arduino is interconnected with the server, it transmits information to the ethernet.

![Ethernet Shield](image1)

VII. RF transmitter and receiver

![RF Receiver Module](image2)
Fig. 6. RF Transmitter Module

A Radio frequency or RF segment is a device that is used for transceiving data wirelessly. In this research, Radio frequency segment contains the specific address of the device. It has a flag which shows the positive output if the object stays in the same spot for more than a specified time.

VIII. Bit Voicer

A voice controlled software which is well-suited with the arduino. User can give command through Bit voicer to the arduino board by interfacing and can be operated.

IX. Arduino

A microcontroller board of Uno is of the model-ATmega328T. It contains the following segments as shown in the figure:

Fig. 7. Arduino Board

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X. Working of the System

This proposed (HAS) system helps to ease disabled and elder person as it is fully worked on Bit voice. It brings comforts to in installing, working and maintaining. It has two nodes.

XI. Automatic Mode

This system works on the user commands automatically. Starting with the voice command to suggest and then confirmation of different components and performance is observed by linking with the Wi-Fi. These hubs collect the information and send to the server and gives permission to perform.

Fig.8. Keyword “ON”-Automatic Control of Electrical Appliances

The information holds about the internet of Things (IOT) that keeps control of the voice and receives online the information to store the readings of temperature and humidity.

Fig.9. Switched LEDs

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XII. Manual mode

If the command doesn’t want to apply automatic mode, then he can change the mode to manual just giving the command voice ‘autohome’. Sensors will stop working and then controls will go into the user’s hand. The user has different options to do.

1) “Fan”- This will change the current state of the fan (fig. 9)

Fig.10. “Autohome Fan” Command

Fig.11. Fan’s LED On

If the user desire to use the automatic mode again, give the command of ‘on’, the system will turn into automatic mode.
With the help of the proposed outputs, it shows that the system is in the working mode and there is no mismanagement if the system doesn’t collapse. If so many devices connected to the system then it might slow down then we have to use powerful arduino instead of low power.

XIII. Conclusion

This proposed system helps in our daily life as it is very useful for the elder and disabled person. It reduces the wiring problems and increase the voice command by using Internet of things. It also proposes that creation capacity and innovation level is improved more and more. Arduino help to control through server and smart phones in the future.

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