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HOME AUTOMATION USING ATMEGA2560 AND VOICE CONTROL, ANDROID APPLICATION-A SURVEY

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ABSTRACT

This paper is based on the best usage of low cost appliances via using Android Applications.. In this paper voice recognition is used by voice command for various home appliances. This system consists of a voice recognition software, Arduino Uno mega 2560 microcontroller, relay circuit, GSM modem, and Bluetooth modem. We can control our appliances with SMS or though Bluetooth. We can even lock our door with GMS and card key. The Card that is used is nothing but the RFID.

KEYWORDS: *Bluetooth, GSM, Security, Voice Controller.*

I. INTRODUCTION

This Automation system can be used to control our home appliances. This system works on wireless communication with your home appliances[5]. This system can even control the home appliances with the help of the Mobile Phone. If one wants to control the home appliances form anywhere, it can be done with the help of SMS(Short message service)[1][2] or through Bluetooth. By using this system the user can send a command form his/her mobile to this device and accordingly the task will be performed[7]. A Command can also be send with your voice and the home appliances can be controlled with voice [3][6].

Figure 1: Controller

II. NEED OF STUDY

The device is much helpful in controlling home appliances. It reduces the wastage of valuable time and our daily life become easier and flexible. When we leave for home we forget to turn off the lights and fan with the help of Bluetooth or GSM modem the lights and fans can be turned off[1][2][7]

III. PROBLEM STATEMENT

Short people can't reach to the switch. When we are leaving from home we forget the turn off the light and fan, which resulted in wastage of electricity when we are not using such electrical appliances.

IV. HYPOTHESIS

We can connect devices through Wi-Fi modem and also control the appliances in the private network. Till the range reaches we can access our appliance.
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V. RESEARCH METHODOLOGY

- **Arduino Mega 2560**

The **Arduino Mega 2560** is a microcontroller board based on the AT mega 2560. The MEGA 2560 is designed for more complex projects. With 54 digital I/O pins, 16 analog inputs and a larger space for your sketch. Pulse Width Modulation, or PWM, is a technique for getting analog results with digital means[5]. This board sends the digital sign to the electronic component then components perform the task. This on-off pattern will simulate voltages in between full on (5 Volts) and off (0 Volts) by dynamical the portion of the time the signal spends on versus the time that the signal spends off.[4]

Figure 2: Arduino Mega

- **RFID(Radio-frequency identification)**

RFID uses Radio frequency fields to automatically identify and track tags attached to objects[6]. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have an area power supply (such as a battery) and will operate many meters from the RFID reader. This allow the high security system for our home. If tag or key card is matched then only this device will allow you to get inside the home.

- **RELAY**

Circuits that use a machine at high voltages or at high currents cannot be tested directly by an Arduino[4]. Instead, you use a low-voltage control signal from the Arduino to control a relay, which is capable of handling and switching high-voltage or high-power circuits[6]. Relay get the charge for the 6v adaptor and perform the task on and off the appliances [3][2].

A relay typically has five pins[7]:

1. **Coil input pin1:** This is generally connected to the positive terminal of your signal source.
2. **Coil input pin2:** This is generally connected to the negative terminal of your signal source.
3. **Normally Open pin(NO):** This pin is normally not connected to the common pin, it is connected when the relay is activated.
4. **Normally closed pin(NC):** This pin is normally attached to common pin and get disconnected when relay is activated.
5. **Common:** In most of the cases, this pin is connected to the ground of the source we use to drive the appliance.

- **BLUETOOTH**

HC 05/06 works on serial communication. The Android app is developed to pass serial data to the Arduino Bluetooth module when a button is pressed on the app[2]. The Arduino Bluetooth module at the other end receives the data and sends it to the Arduino through the TX pin of the Bluetooth module (connected to RX pin of Arduino).[2] When RX get the command form the Bluetooth modem then they perform the task.[1][2]

- **GSM(Global System Modem)**

GSM Modem is nothing global system for mobile is use for to communicate the device for anywhere in the world. We send the command with the help of SMS[1]. There are various AT commands like ATA for answer a call, ATD to dial a call,

AT+CMGR to read the message, AT+CMGS to send the sms etc[1]. AT commands should be followed by Carriage return i.e. \r (0D in hex), like "AT+CMGS\r". We can use GSM[1]

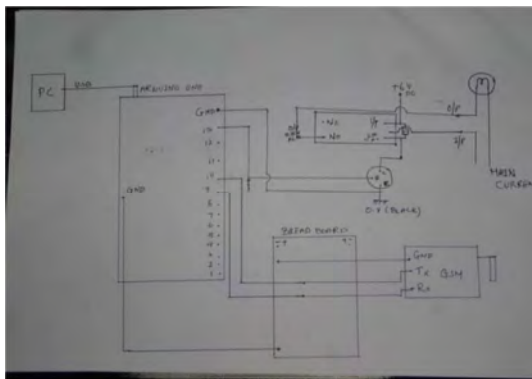Figure 3: GSM Modem

- **WORKING**
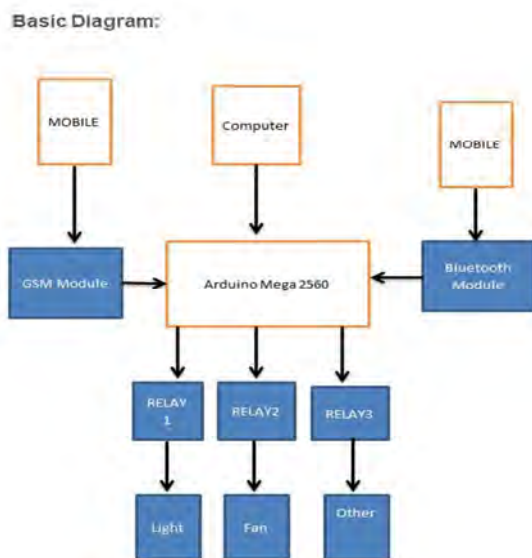

Figure 4: Circuit Diagram

Figure 5: Basic Diagram of working

Pc is connect to the Arduino board we are sending the command through the Serial port GSM module receive the sms and arduino read the SMS and perform the task[1][2]

VI. RECOMMENDATIONS

- Turn on or off the home appliances.
- Lock or unlock your door with your mobile phone.

VII. CONCLUSION

From this we hereby conclude that this equipment can be used in controlling our home appliances in much efficient way by monitoring & managing.

VIII. FUTURE SCOPE

In India automation is very costly for customer we are just trying lowering the price of the automation, in which we use the home automation system for our house. And this is very helpful to us to turn on and off the appliances.

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