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Bluetooth Based Wireless Home Automation System

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ABSTRACT: The recent advancements in VLSI and IOT technology has made tremendous impact on the human life.The technological advancements have led to innovative products which lead to improvement in the life of people. In this work, we are introducing a Bluetooth based wireless home automation system. Using this device, we can control various home appliances in many different ways likevoice control or using mobile as a remote. This product can be really helpful to physically challenged and disabled people. Also, In this work, we can control devices from long distance by usingWi-Fi.

I. INTRODUCTION

There isincreasing demand for smart homes,where appliances react automatically to changing environmental conditions and can be easily controlled through one common device.This project presents a possible solution whereby the user control devices by using their existing mobile phone, where control is communicated to the microcontroller from a mobile phone through its Bluetooth interface.Home automation involves introducing a degree of computerized or automatic control to certain electrical and electronics systems in a building likelight,fan,Air conditioners, TV,etc.This paper demonstrates a simple home automation system which contains a remote mobile host controller and several client modules(home appliances).This client modules communicate with host controllers through a wireless device such a Bluetoothenabled mobile phone,in this case,an android based smart phone.

Project Description:
A block diagramand a flowchart was used as guide to visualize the arrangement of steps to be followed through the system management process of home automation device.
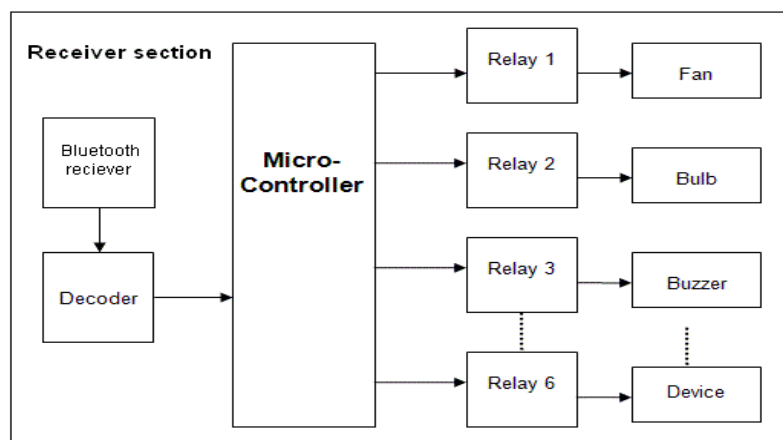

Figure – 1: Block Diagram of Home Automation System

Fig. 1shows the block diagram of the proposed system. The system block diagram shows that when the power of system is switched on, the sensor starts taking values. Firstly, Bluetooth receiver receives the signal then it transmits to

the microcontroller then to the relays we connected with the project then with the devices which we need to operate by the commands.
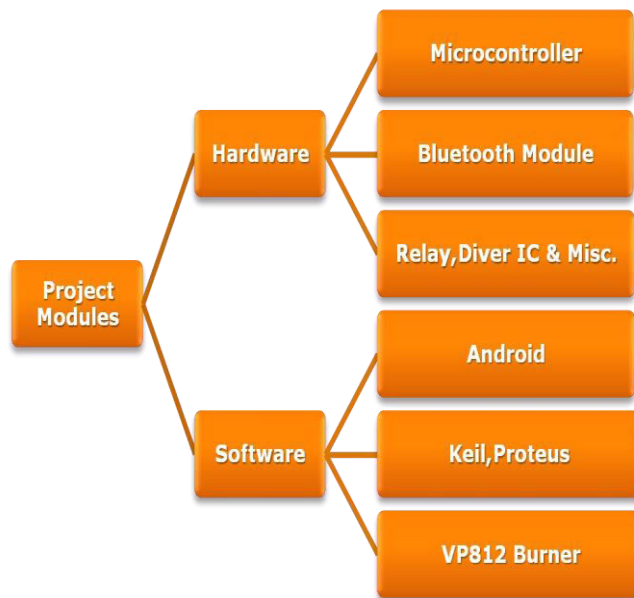

Figure – 2: Project Modules of Home Automation System

Fig 2shows the project modules of home automation system which are of two types, Hardware And Software. The hardware module has microcontroller,Bluetooth module, relay, driver IC and misc.The software module has android and aurdino IDE.

HARDWARE USED
For making the system successful, design implementations plays an important role. The components required to execute this system are briefly described below.

ARDUNIUO MICROCONTROLLER IC
Specifications:-
Microcontroller : ATmega328 SMD.Operating Voltage : 5V.Analog Input Pins : 6.
Supply Voltage recommended : 7-12V DC.Digital I/O Pins : 14 (of which 6 provide PWM output).
DC Current per I/O Pin : 40 mA.DC Current for 3.3V Pin : 50 mA.SRAM : 2 KB (ATmega328).Flash Memory : 32 KB (ATmega328) of which 0.5 KB used by bootloader.
SRAM : 2 KB (ATmega328).EEPROM : 1 KB (ATmega328).Clock Speed : 16 MHz.

HC-05 BLUETOOTH MODULE

Hc-05 is a *Bluetooth* Smart module targeted for low-power sensors and accessories.

It integrates all features required for a *Bluetooth* Smart application.

It is powered directly from a standard mobile charger.

In the lowest power sleep mode, it merely consumes 500nA and will wake up within a few hundred microseconds.
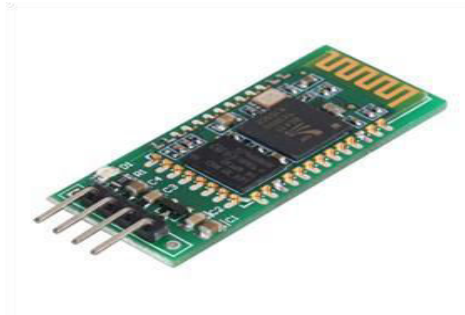
RELAYS

A relay is an electrically operated switch.

Relays are used where it is necessary to control a circuit by a low-powersignal.

Relays protect electrical circuits from overload or faults.

TRANSMITTER/CONTROLLING UNIT

Android has an active community of developers and enthusiasts who use the *Android Open Source Project* (AOSP) source code to develop and distribute their own modified versions of the operating system.


RESULTS AND CONCLUSION

In conclusion, this low-cost system is designed to improve the standard living in home. The remote-control function by smart phone provides help and assistance specially to disabled and elderly. In order to provide safety protection to the user, a low voltage activating switches is replaced current electrical switches. Moreover, implementation of wireless Bluetooth connection in control board allows the system install in more simple way. The control board is directly installed beside the electrical switches whereby the switching connection is controlled by relay. Furthermore, flexible types of connections are designed as backup connections to the system. The connected GUIs are synchronized to the control board. They indicate the real-time switches status. The system is designed in user-friendly interface. The easy to use interface on Window and Android GUI provides simple control by the elderly and disabled people. For future work, the Window GUI will be implemented with speech recognition voice control. The android GUI will be implemented as a remote Bluetooth microphone to the Window GUI. All the voice signal inputs to the smart phone will be transmitted to the Window GUI for signal processing. Also, the push buttons implemented in low voltage activating switches will be replaced by capacitive sensing switches. All the future work is expected without spend extra cost, even one cent from the current system.

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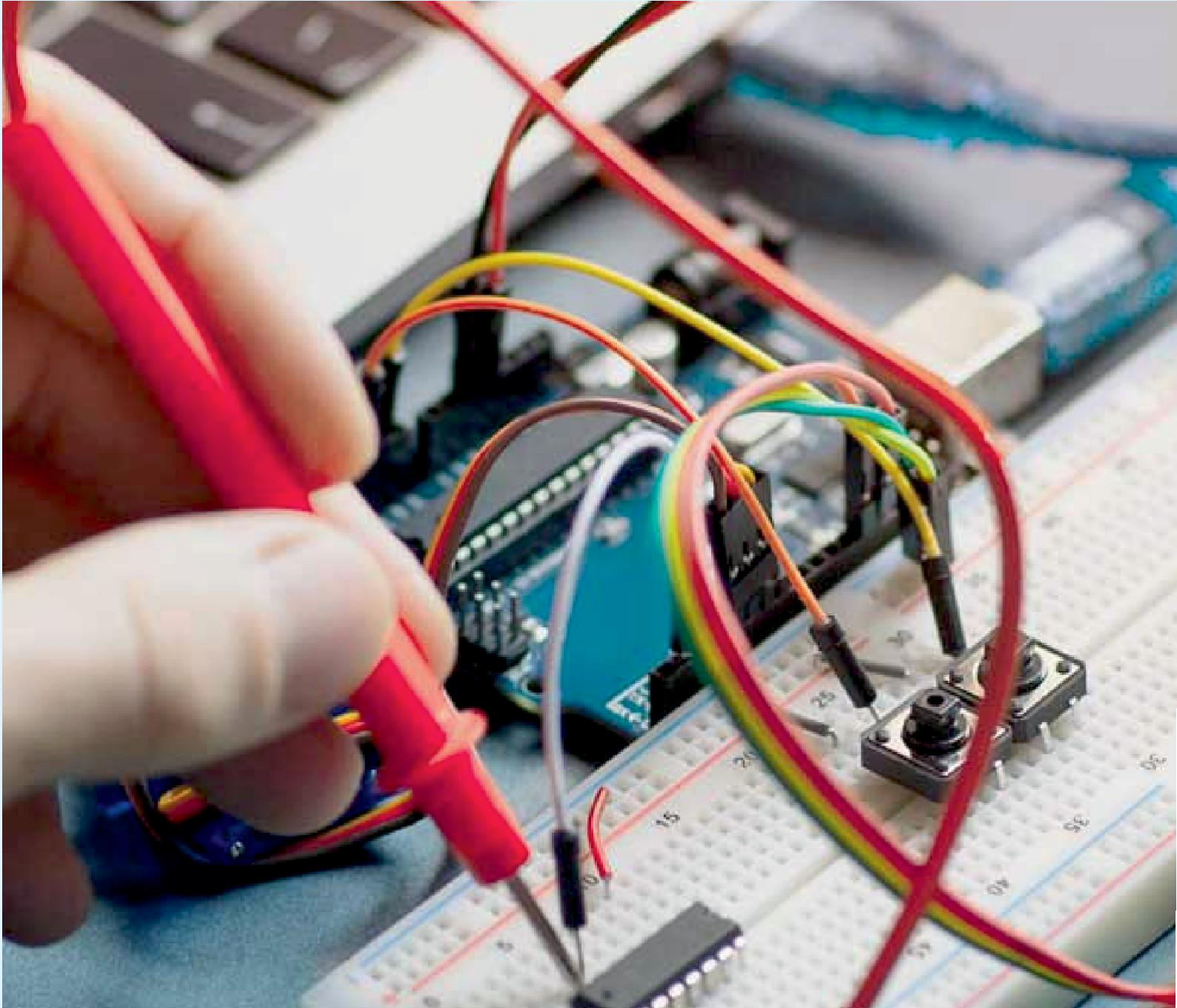
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