Home Automation Lighting System using Bluetooth

Ms. Snehal Pagare[1], Ms. Snehal Patil[2], Ms. Kranti Chavan[3], Mr. Vedant Sahane[4], Mr. Harshal Pawar[5]

Lecturer, Department of Computer Engineering[1]
Students, DepartmentofComputerEngineering[2,3,4,5]
Mahavir Polytechnic, Nashik, Maharashtra, India

Abstract*: The main objective of this project is to develop a home automation system using Arduino board with Bluetooth being remotely controlled by any Android OS smart phone. As technology is advancing so houses are also 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 makes 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 do so. Remote controlled home automation system provides a most modern solution with smart phones. 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. Wireless technologies are becoming more popular around the world and the consumers appreciate this wireless lifestyle which gives them relief from the well known" cable chaos" that tends to grow under their desk. Now with the embedded Bluetooth technology, digital devices form a network in which the appliances and devices can communicate with each other. Today, home automation is one of the major applications of Bluetooth technology. Operating over an unlicensed, globally available frequency of 2.4GHz, it can link digital devices within a range of 10m to 100m at the speed of up to 3Mbps depending on the Bluetooth device class. With this capability of Bluetooth; we propose a home automation system based on Bluetooth technology.*

Keywords: Bluetooth

I. INTRODUCTION

Nowadays automation systems have become widespread in several industries by playing a vital role in dominating many process-related operations. We live in the world of automation wherein most of the systems have become machine-driven, such as industrial automation, automation in homes and alternative business sectors. Home automation systems advancing towards mechanization processes whereby fewer human efforts are required by the machinery equipment to control numerous systems in homes. It involves automatic controlling of home appliances using completely different technologies and controllers over desktops, laptops good phones or tablets. Automation systems are classified into two types: industrial automation system and home automation systems. Automation systems are classified into two types such as industrial automation system and home automation systems. Home automation systems are further classified into three types: Power line Based Home Automation Wired or BUS Cable Home Automation Wireless Home Automation. This article discusses the home automation projects that use Android, DTMF, RF, Arduino and touch screen

II. METHODOLOGY

1. System Design:
   - Define system architecture for the GPS-based attendance system.
   - Specify system requirements, design the user interface, and create a database schema for attendance data storage.

2. GPS Integration:
- Select and integrate GPS technology into the system.
- Choose appropriate GPS hardware and software.
- Configure the GPS device for required accuracy.
- Develop GPS-based algorithms for calculating attendance based on location.

3. Authentication:
- Implement authentication mechanisms to control system access.
- Utilize methods such as passwords, biometric verification, or RFID tags.
- Ensure only authorized personnel can access the GPS-based attendance system.

4. Attendance Tracking:
- Enable real-time attendance tracking using integrated GPS.
- Automatically record location data when individuals enter or leave the premises.

5. Data Management:
- Store attendance data collected by the GPS-based system in a database.
- Implement efficient data management practices.
- Enable the system to generate reports summarizing attendance data and identifying trends.

III. IMPLIMENTATION OF PROPOSED MODEL

- HC-05 has red LED which indicates connection status, whether the Bluetooth is connected or not. Before connecting to HC-05 module this red LED blinks continuously in a periodic manner. When it gets connected to any other Bluetooth device, its blinking slows down to two seconds.
- This module works on 3.3V. We can connect 5V supply voltage as well since the module has on board 5 to 3.3 V regulator.
- As HC-05 Bluetooth module has 3.3V level for RX/TX and microcontroller can detect 3.3 V level, so, no need to shift transmit level of HC-05 module. But we need to shift the transmit voltage level from microcontroller to RX of HC-05 module.
- The data transfer rate of HC-05 module can vary up to 1Mbps is in the range of 10 meters.

3.1 Implementation of Home Automation Using Bluetooth Module System Architecture

174
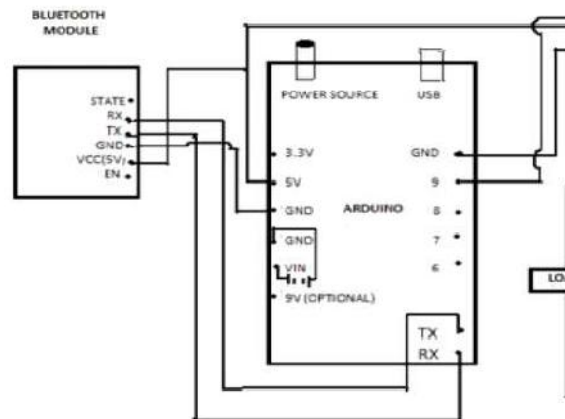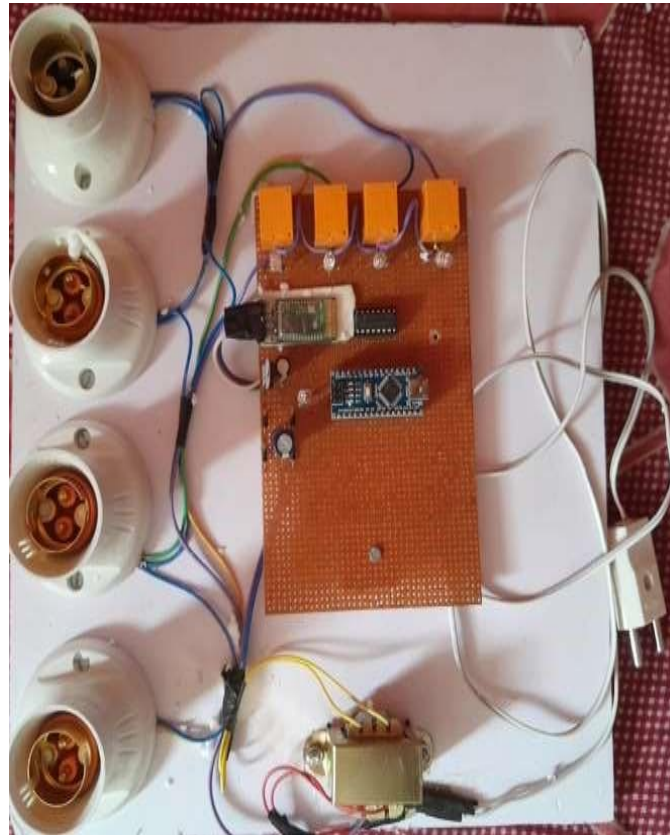
The project is built on Arduino UNO and is used to control LEDs and four home appliances connected to the Arduino through relays. The Arduino board is interfaced to an HC-05 Bluetooth module to pair with the smart phone.

An app named "Bluetooth Terminal" is used on the smart phone which is capable of sending text strings to a paired device. Another app named "BT Voice Control for Android" can also be used on the smart phone. The BT Voice app takes voice commands in US English and transfers them as text strings to a paired device. Either of the app will pair with the home automation system through HC-05 Bluetooth Module. Every module has a unique MAC address and a password for pairing with other devices. Like the Bluetooth module used in this project had a MAC address – 98:D3:31:F4:18:22 and had a password "1234" for pairing with other Bluetooth devices.

The Arduino board receives the user commands in the form of numbers from the smart phone through Bluetooth interface. These numbers are assigned to the home appliances and the appliances are toggled either ON or OFF on receiving the numeric command. The Arduino sketch looks for the numeric commands from the Bluetooth module and operates relay switch appliances.

IV. ADVANTAGES

- Home automation increases safety and security.
- Home automation is convenient.
- Home automation offers data and control.
- Home automation creates comforting routines.
- Home automation improves peace of mind.
- Home automation can save energy

V. LIMITATIONS

1. High computational cost.
2. Need a lot of training data.
3. Internet Connection.

VI. CONCLUSION

Survey of different home automation system shows that there are various kinds of technologies used to implement this type of system. All the proposed systems have been presented and compared in this paper which reveals some merits and demerits of the systems. This review explained different home automation system e.g. Web based, Bluetooth-based, mobile-based, SMS based, Zigbased, Arduino microcontroller based, Android app based, IOT based and cloud-based. Due to its performance, simplicity, low cost and reliability home automation system is making its position in global market, that day is not so far when every home will be the smart home.

VII. ACKNOWLEDGMENT

REFERENCES

[1]. ABI Research on home automation future: https://www.abiresearch.com/press/15-millionhomeautomation-systems-installed-in-th

[2]. Pew Research center: http://www.pewInternet.org/2014/04/03/olderadults-and-technology-use/

[3]. Nest Thermostat: https://nest.com/thermostat/meetnest-thermostat R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.

[4]. Blynk working:https://docs.blynk.cc/

[5]. Blynk: https://www.blynk.cc/

[6]. IFTTT working: https://www.pocket-lint.com › Smart Home › Smart Home news

[7]. IFTTT: https://ifttt.com/discover

[8]. Google Nest news: http://www.independent.co.uk/lifestyle/gadgets-and-tech/google-buys-nestwhat-doesthis-mean-for-home-automation-the-internet-of-thingsand-apple-9058217.html

[9]. Gigaom.com:https://gigaom.com/2014/10/03/belkinlooks-at-the-smart-home-and-doesnt-see-aplace-forhubs/'

[10]. ZigBee as Communication Platform for smart house applications: International Journal of Engineering - ISSN: 1584–2673 [11] IOT Bytes pinouts: https://iotbytes.wordpress.com/