

# Bluetooth Based Home Automation System

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**Abstract:** Home automation is one of the research areas that have become very relevant in the last few years. Wireless home automation systems have been a major area of interest for researchers in recent years. The present paper looks at short - range wireless home automation solutions and proposes an effective controller-based model using the Arduino board.

**Keywords:** Wireless, Home Automation, Bluetooth, Arduino, Microcontroller, Sensor

## I. INTRODUCTION

Automation can be easily described as anything that is done without human assistance. Modern houses are gradually shifting from conventional switches to centralized control system, involving wireless 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 simpler solution with Android application technology. The current work aims to develop a simple short-range home automation system. Section II surveys some of the recent and relevant literature in the domain of home automation. Section III describes the short-range home automation system proposed by the researchers. Section IV concludes the paper with a discussion on the scope for further research in this domain.

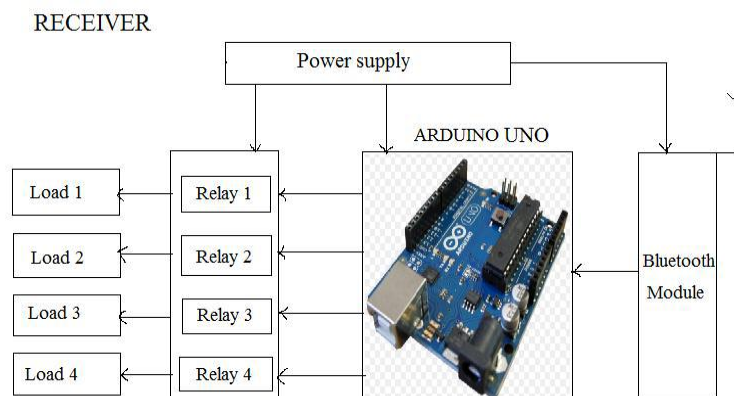
## II. LITERATURE SURVEY

Home automation holds specific benefits to people with restrictions in movements or physical impairments such as elderly people [1]. FPGA and GSM based home automation systems have been proposed by researchers to make home automation affordable [2]. Greater speeds and an increase in failure resistance is observed by researchers in case of cloud based home automation systems [3]. IoT enabled systems that use the Zigbee protocols for connections are also popular among home automation researchers for their benefits [4]. IoT is being more and more extensively used in home automation due to flexibility and robustness [5][6]. Microcontroller boards interfaced with multiple types of sensors are also being extensively used in development of novel home automation solutions [7].

Most home automation solutions are expensive to implement. The current paper aims to address this issue, while maintaining the robustness required, through the proposed system discussed in the following section.

## III. PROPOSED SYSTEM

Home automation systems are for a multitude of benefits with focus on different aspects for different situations or user groups. Some users may require the system to be geared towards security, while others may focus on ease of use.



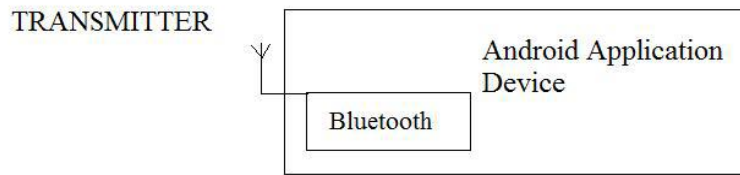


Figure 1: Basic Schematic Diagram

However, there is a general consensus among researchers that security, ease of use and low cost are some of the most important features required from a home automation system. The system proposed in this paper is cheap and robust, consisting of an Arduino board connected to devices through a Bluetooth module. The system is able to take inputs from sensors and control the various connected devices, or it can allow for simple remote control of the devices if the user requires doing so. The schematic diagram of the setup is presented in the following figure 1.

The pin-out diagram of the Arduino board is shown in figure 2. The remote devices are switched on and off through relays connected by Bluetooth to the Arduino.

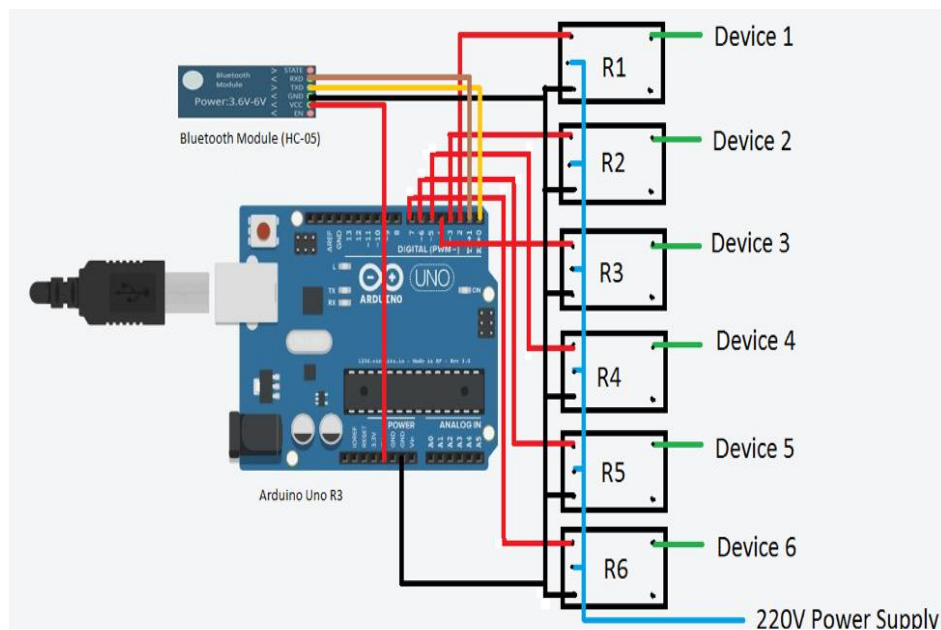


Figure 2: Pin-out Diagram

The advantage of the proposed system is its simplicity, low cost and flexibility. Its simplicity makes the system easier to repair or replace required components in the advent of a failure or burnout. A simple prototype of the system is shown in Figure 3.



Figure 3: Simple Prototype

**IV. CONCLUSION**

The current work accomplished in this paper comprised of design of a simple prototype of a Bluetooth-based home automation system. A future work in this direction may be the implementation of basic machine learning using linear or logistic regression, allowing systems to be controlled in a semi-intuitive fashion, but involving the use of additional memory modules, further increasing the ease of use of the system.

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