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Controlling Lights Using Bluetooth

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Abstract: *Bluetooth based Home Automation is no more in the beginning stage. Home Automation alludes to Controlling of electronic aplliancesin the house utilizing at least one experts and any Communication medium like Bluetooth, RS232, Ethernet and so forth. Choice of Communication medium is very crucial when it comes to home Automation. Factors such as range, security, data rate, cost and accessibility need to be considered whle choosing a medium. Nowdays Bluetooth is available in almost all the phones, making it perfect medium for wireless communication between a mobile phone and central controller. This paper describes use of blutooth communication to automate various appliancses in the house through a mobile phone. Any controller can be used for this purpose. In this paper, Aruduino UNO is used for its ease of programming.*

I. Introduction

Home automation has been booming in the current years. In the paper, we have shown that various electronic appliances are controlled using Bluetooth one in the house. Having central control is one of the main feature of Home Automation. Establishing communication between the operator interface hardware and central controller has been topic of debate based on th various parameters that go into deciding particular communication protocol. Being wireless, Bluetooth provides for an effective communication protocol.

In our project we use both Bluetooth to control the appliances. Due to the wireless technology, there are several of connections are introduced like Bluetooth, FPGA and ZIGBEE. Each of the connection has their unique specifications and applications. Among the four wireless connections, Bluetooth is chosen with its suitable ability to control appliances. Also, most of the current laptop or cell phones are come with built-in Bluetooth adapter. It will reduce the cost of this system.

II. System Analysis

The application of our system is very useful when people who forget to do simple things such as turn ON or OFF devices at their home or in their office, they can do that without their presence by pressing the particular button in our application from their mobile phone. And our system can be very convenient to old age people and handicapped people. We believe that this development will ultimately save a lot of time especially when people don't have to come back for simple things such as to turn ON/OFF switches and can control temperature surrounding and controls Light intensity according environment also at their home or at their office once they set out for their respective work and will be very useful for old age people when they want to turn ON/OFF the light, they needn't call others to help or they needn't walk near the switch.

The objective of this project is to develop a device that allows for a user to control multiple home appliances from both indoor using an android mobile phone. This system can be served as a flexible and powerful tool that can provide the service at anytime and anywhere. The various possible appliances include the lights, Temperature control system but they are not limited to within these devices. Our proposed approach to design the system is to implement a microcontroller based control module that receives the instructions and command from the user through a mobile phone over the Bluetooth. Then the microcontroller will carry out the given commands and then control the devices.

III. Review of Literature

Home automation was first introduced into the world market in the 1970s, but it failed to meet the expectations of people and was unsuccessful. There were various reasons associated with the failure of the home automation system. The system was neither user friendly nor cost efficient. Currently, the foremost point to be kept in mind when designing a home automation system is that it should be cost-efficient and easy to install.

K. Y. Lee and J. W. Choi [1], in their research on the Housing Learning and Improvement Network in 2003, defined a Smart Home as a "unit where all the appliances of the house are connected together and controlled and monitored remotely."

T. Tamura et. al. [2], in their research, constructed the welfare techno houses in Japan in2003. The motive behind the project was to monitor the health of the disabled and older people living in the home, thereby improving their quality of life.

D. J. Cook et. al. [3] successfully conducted the Mav Home project at the University of Texas, Arlington. The project used sensors to detect the state of the environment, and with the help of controllers, took the necessary action to maintain equilibrium. These sensors form an ad-hoc network to make the decisions.

H. Kanma et. al. [4] conducted a medical research to monitor people who require medical help and present a wireless solution at the University of McGill in Canada. The project made use of cell phones and inexpensive sensors. It worked by making use of wireless protocols such as Bluetooth, ZIGBEE, as well as GSM and analyzing data through an adaptive architecture.

N. Liang et. al. [5] have described challenges related to Smart Homes and conducted research at the University of Erlangen, Germany, for the betterment of these populations and identified the benefits in-order to help them lead more independent lives.

For the implementation of these projects, there are various sub-networks used such as the Bluetooth module, Wireless LAN, RFIDs, and TCP/IP. A Bluetooth network transports the sensor data and interconnects the network. As per the location of the occupancy recorded, the RFID system transmits data from the RFID tags. The messages are transmitted via Bluetooth using Bluetooth modules. This reduces the cost, as no further hardware is required for the implementation.

IV. Block Diagram

The figure 1 is the simple block diagram of our project. It shows a simple sketch of the implementation of our project and the various parts involved in it. The Micro controller Device is the device through which application interacts with home appliances. Mode is used for selecting either Bluetooth or GSM through which to control the appliances. The commands will be received based on the mode selection by the appropriate device from the android application.

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. A light dependant resistor likewise know as a LDR, photograph resistor, photoconductor or photocell, is a resistor whose protection increments or abatements relying upon the measure of light power. Bluetooth is a determination for a little shape factor, minimal effort radio arrangement giving connections between versatile PCs, cell phones and other convenient handheld gadgets, and network to the Internet. A hand-off is an electrical switch that uses an electromagnet to move the change from the off to on position rather than a man moving the switch.

There are two sorts of correspondence engaged with this undertaking: wired and remote correspondence. The correspondence between the Bluetooth module and the Android based cell phone will help associate with the controller remotely. Interestingly, wired correspondence is the correspondence between the controller and the apparatuses.

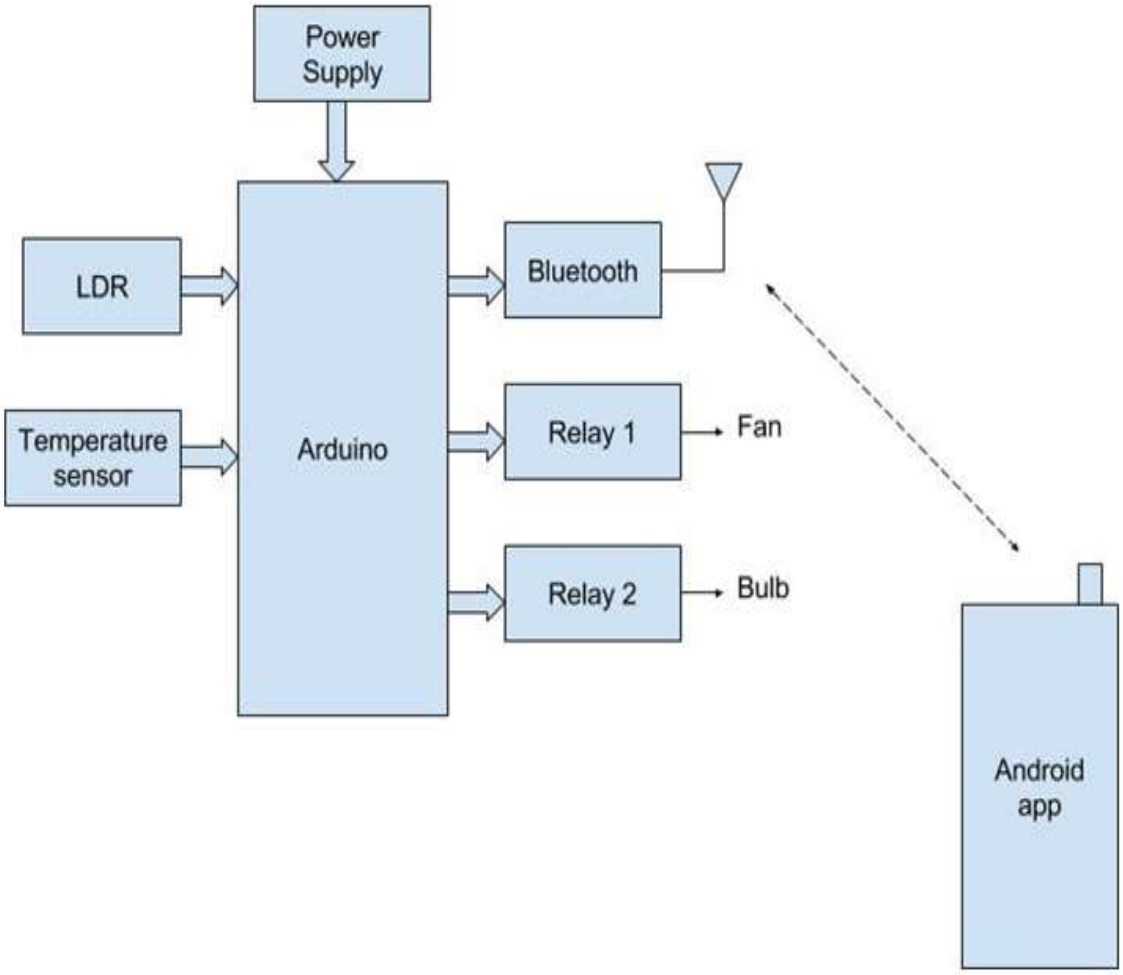

Figure 1

V. System Implementation

The various modules used in our project are communication module, messaging module, user interface module and display module. The communication module describes how the connections are made with the pic microcontroller for Bluetooth communications. For Smart Living concept, Bluetooth technology has been one of the major technologies. It is a remote innovation created to supplant links on gadgets like cell phones and PCs. By utilizing Bluetooth, remote gadgets can speak with each other inside range. These days parcel and loads of Smart Living applications have been created which depend on Android and Bluetooth. Android framework gives SDK and APIs to engineers to construct new applications. Many Smart Living systems are constructed under Android system with Bluetooth integrated into Android system.

The android application is act as a user interface, through which the user can easily control the devices. Figure 2 is the sample snapshots of our android application i.e. user interface module. The Liquid crystal display is used to denote the commands sent by the android application. In figure 2, we can use Manual mode for controlling Appliances like Light and Fans manually, such as ON/OFF Light and Fan.

Figure 2

VI. Conclusion

The Bluetooth based Home Automation System with an automated home model is built. Our prime objective is assist to handicapped/old aged people. This project gives basic idea of how to control various home appliances and provide a security using Android phone/tab. This project is based on Android and Arduino platform. So the overall implementation cost is very cheap and it is affordable by common person.

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