iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** VII **Month of publication:** July 2021

DOI: https://doi.org/10.22214/ijraset.2021.36231

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue VII July 2021- Available at www.ijraset.com

Arduino Based Home Automation using TV Remote

K Mounika[1], P V S N Gayathri[2], S Karunya[3], N Srishyla[4], Dr. Basavaraju G M[5]
[1,2,3,4]*Student,* [5]*Associate professor, Department of ECE, NCET Bengaluru, India*

Abstract*: House control and monitoring system using Bluetooth and infrared. In Bluetooth with android smart phone connectivity and for accessing and controlling devices and appliances remotely using Android based Smart phone applications. In IR-based house Appliances Control System is a control system using which the user can control different home appliances with a remote controller. The future system does not require a dedicated server PC with respect to similar systems and offers a novel communication protocol to monitor and control the house environment with more than just the switching functionality. House automation using Bluetooth is a residence incorporating a communications network that connects the electric home equipment and offerings letting them be remotely controlled, monitored or accessed. house automation System includes different approaches to achieve multiple objectives range from enhancing consolation in day by day existence to permitting a greater unbiased existence for aged and handicapped people. The system design is based on Arduino Microcontroller using C/C++, language software, Bluetooth and infrared (IR) which is used in different monitoring and control processes. This project the combination hardware and software implementation of a multiple form control system for house automation, combines both hardware and software technologies. The system results show that it can be classified as comfortable, secure, private, economic and safe house automation in addition to its great flexibility and Reliability.

Keywords: Home Automation, Arduino, TV Remote

I. INTRODUCTION

Now a day's Wireless technologies are becoming more popular around the world and the consumers appreciate this wireless lifestyle. Home automations one of the major applications of wireless technologies house automation involves the monitoring and control of activities such as lighting, heating, ventilation, air conditioning (HVAC), electrical appliances, sound systems security cameras, door locks, and alarms **Etc.** house Automation can definitely make life at home much easier. For that the millions of people affected by disabilities and also the elderly people, it can make a life changing difference. Our project presents the overall design of home Automation System (CAS) with low cost both integration Bluetooth and infrared system. This system is designed to help and provide support in order to fulfil the needs of elderly and disabled people in home. Also, the main control system implements wireless Bluetooth and infrared technology to provide remote access from smart phone and remote control.

II. RELATEDWORKS

House automation was first introduced into the world market in the 1970s, but it failed to meet the expectations of people and was unsuccessful. There have been diverse motives related to the failure of the house automation system. The system was neither user friendly nor cost efficient. Currently, the foremost point to be kept in mind when designing a house 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 in 2003. 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 by the Home project at the University of Texas, Arlington. Here 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. Kanmaet. 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 labored with the aid of using utilising wi-fi protocols consisting of Bluetooth, ZIGBEE, in addition to GSM and reading statistics thru an adaptive architecture. The research had an architecture that consisted of three main parts. The major benefit of this project is that it could be implemented at an inexpensive price in a short span of time. In the past few years, significant research has been conducted in the field of Smart Homes to make the technology better for handicapped and elderly people. N. Sriskanthan et al.[5] shows the implementation of a home automation system using Bluetooth. They use a number controller, that is carried out on a PC, is

©IJRASET: All Rights are Reserved

attached to a micro-controller-primarily based totally sensor and tool controllers. Home Automation Protocol (HAP) is proposed to make the communication between devices possible. The system allows more than one device controller to be connected to the host controller.H. Kanma et al. [6] also proposes a home automation system using Bluetooth that can be accessed remotely through GPRS. The paper discusses controlling and updating home devices along with fault detection and diagnostics remotely. The hardware required for organising Bluetooth conversation is without difficulty to be had and the era also provides the necessary bandwidth for the operation in a home. R. A. Ramlee et al. [7] presents the not only overall design of Home Automation System (HAS) but also this system is Designed to help and offer aid in an effort to fulfill the wishes of aged and disabled in home. S. Benjamin Arul [8] provides the overall design of a wireless home automation system (WHAS) which has been built and implemented and beneficial for aged and disabled human beings with an easy-to-use domestic automation machine that may be completely operated primarily based totally on speech commands. In this system, the automation centres on recognition of voice commands of user and uses low-power RF ZigBee wireless communication modules for the communication between the automation center and the system.SharonPanth&Jivani Mahesh et al. [9] proposed a methodology to automate home by using android for mobile phone. Here author discusses the use of android mobile phone's inbuilt facility i.e. Bluetooth to automate domestic alongside the usage of an ATMEL 89C51, 8-bit microcontroller. Pawan Sharma &Joshi Deepikaet al. [10] has proposed a methodology about controlling home appliances through remote operated master switch via infrared technology. They have introduced a unique remote-control circuit to permit the automatic control of switches and switchboards from a remote location that does not require any internet network as well as mobile network or battery. It became a totally hardware-primarily based totally device and does now no longer require any software program to govern and screen the device. SamiranMaiti&Pabitra Kumar Nandi et al. [11] proposed a solution of home appliance controlling by the use of IR remote control signal decoder. Author discusses approximately using NEC555 timer IC, decade counter, Triac at the side of IR sensor to automate home. It is also a hardware-based project. Summary of Literature Review: In that existing literature review we got a home automation system designed by both Bluetooth or infrared that design to help elderly and handicapped people live a more independent life. if the project is made from only Bluetooth some peoples, they have no skills to use smart phone they cannot use the technology. And also, the peoples do not have possibilities to use the infrared or the remote control they also do not use this technology.

III. METHODOLOGY

The main component of the project is the TSOP1738 receiver. It is a 3 pin tool in which the 3 pins are GND, VS and OUTPUT. The VS pin is attached to the 5V supply. The output pin is connected to pin 11 of arduino UNO. We are using a 4-channel relay module in this project in order to control 4 different loads. Since the board has all of the vital additives like transistors, LEDs etc. All we want to do is to attach the four inputs at the relay board to four virtual I/O pins of arduino. More distinctive connection may be discovered with inside the circuit diagram. Home automation is an in call for idea in which a unmarried tool will manage exclusive home equipment of a home. Additionally, distinct factors like temperature, humidity, safety etc. also can be monitored the usage of that device.

In this project, a simple home automation system where the system controls 4 different appliances with the help of a TV Remote. The operating of the task is defined here. The main component of the project is TSOP1738 IR Receiver Module. This module has a built – in photo receiver, band pass filter and demodulator and the output of the module can be readily read by a microcontroller. TSOP1738 helps a service frequency of 38 KHz. Hence, the carrier frequency of the source i.e. the remote control must be in the range of 38 KHz for it to demodulate. We will decode the information from the far flung manage the usage of TSOP1738 and Arduino UNO. For that, we need to use a special library called "IR remote".

IV. BLOCK DIAGRAM

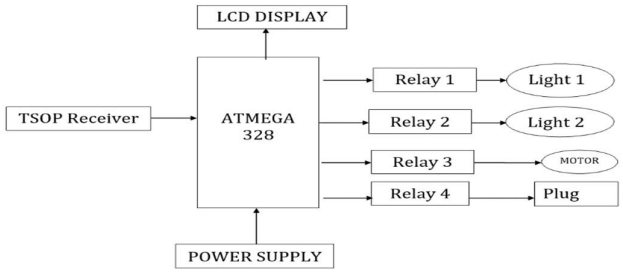


Fig 1: Block Diagram

©IJRASET: All Rights are Reserved

The working of the block diagram is shown in above the fig. Each button on IR remote has its unique value. For suppose we use each button separately. We used 3 buttons labels as "1. 2. 3" Each button on IR far off has its specific value. When we pressed the button from remote it send infrared signal which is then receives by the IR receiver. Arduino read the signal and perform the corresponding operation like switch on and off appliances and display status on LCD. The enter pins of the module paintings inversely. we can see the relay will be activated when the input pin will be LOW because in that way the current will be able to flow from the VCC to the input pin which is low or ground, and the LED will light up and active the relay. When we press button one "1" from the remote Arduino reads the value and compare it with the value defined in code. If it is equal than Arduino switch on the first relay and the bulb light up and ifit press again the bulb light off. Other two buttons works similarly.

V. FLOW CHART

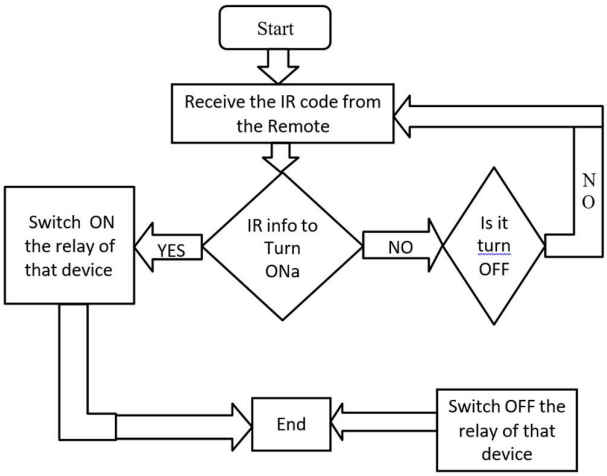


Fig 2: Flow Chart

The flowchart in Fig. 2 depicts the programming for the application process. The controller waits for the enter from the IR sensor and remote. The remote sends the corresponding train of pulses after the user presses the desired button of the remote. The controller gets the code transmitted from the far flung and decodes it within side the controller. The received information is decoded form in the first step of the simulation. [4]. Once the information is decoded for switching ON or OFF a particular device, the corresponding relay is caused via way of means of the microcontroller and eventually the corresponding tool is switched ON and OFF the use of a easy IR Remote. Based at the facts furnished via way of means of the consumer to toggle the tool ON or OFF via way of means of a unmarried enter from IR remote. As same button is used to toggle the device ON or OFF, the process first checks the present state of the device. Processing of information is done and necessary signal is generated to control the relay associated with the device. This is observed throughout all of the Components and gadgets related within side the domestic automation process.

The Bluetooth-based house automation system using an Android phone was successfully implemented. This project is used for disabled persons and old people.

VI. RESULT

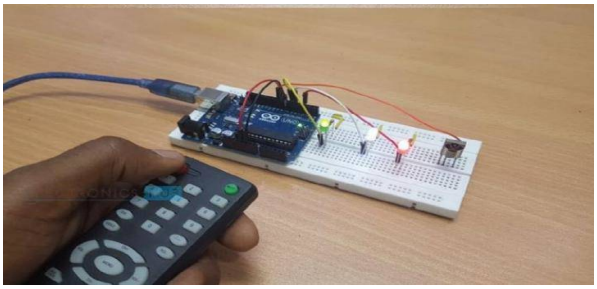


Fig 3: Result

©IJRASET: All Rights are Reserved

VII. CONCLUSION

'House automation' makes the system more flexible and Provides attractive user interface compared to other home automation systems.Here target is to control home appliances using the wireless technology to connect system parts, simplify home automation system. Consequently, it can conclude that the required goals and objectives of house automation system have been achieved. It is based on Android application and Arduino platform both of which are FOSS (Free Open Source Software). So the overall implementation cost is very cheap and it is affordable price by a common person. Looking at the current situation, chosen Android platform so that most of the people can get benefit. The implementation consists of Android phone with house automation application, Arduino Mega. User can work together with the Android phone and send control signal to the Arduino, which in turn will control other embedded devices/sensors Here discussed a simple prototype, but in future it can be extended too many other areas.

REFERENCES

[1] R. Shahriyar, E. Hoque, S. M. Sohan, I. Naim, M. M. Akbar, and M. K. Khan, "Remote Controlling of Home Appliances using Mobile Telephony", International Journal of Smart Home, Vol. 2, No. 3, July, 2008.

[2] C. K. Das, M. Sanaullah, H. M. G. Sarower and M. M. Hassan, "Development of a cell phone based remote control system: an effective switching system for controlling home and office appliances", International Journal of Electrical & Computer Sciences IJECS, Vol. 9, No. 10, pp. 37-43, 2009.

[3] M. S. H. Khiyal, A. Khan, and E. Shehzadi, "SMS Based Wireless Home Appliance Control System (HACS) for Automating Appliances and Security", Issues in Informing Science and Information Technology, vol. 9, pp. 887-894, 2009.

[4] I. Kaur, "Microcontroller Based Home Automation SystemWith Security", International Journal of Advanced Computer Science and Applications (IJACSA), Vol. 1, No. 6, December 2010.

[5] Ahmed M. S., Mohammed A. S., Onimole T. G., Attah P. O., Leonardo Electronic Journal Of Practices and Technologies,9,p.55-62, 2006.

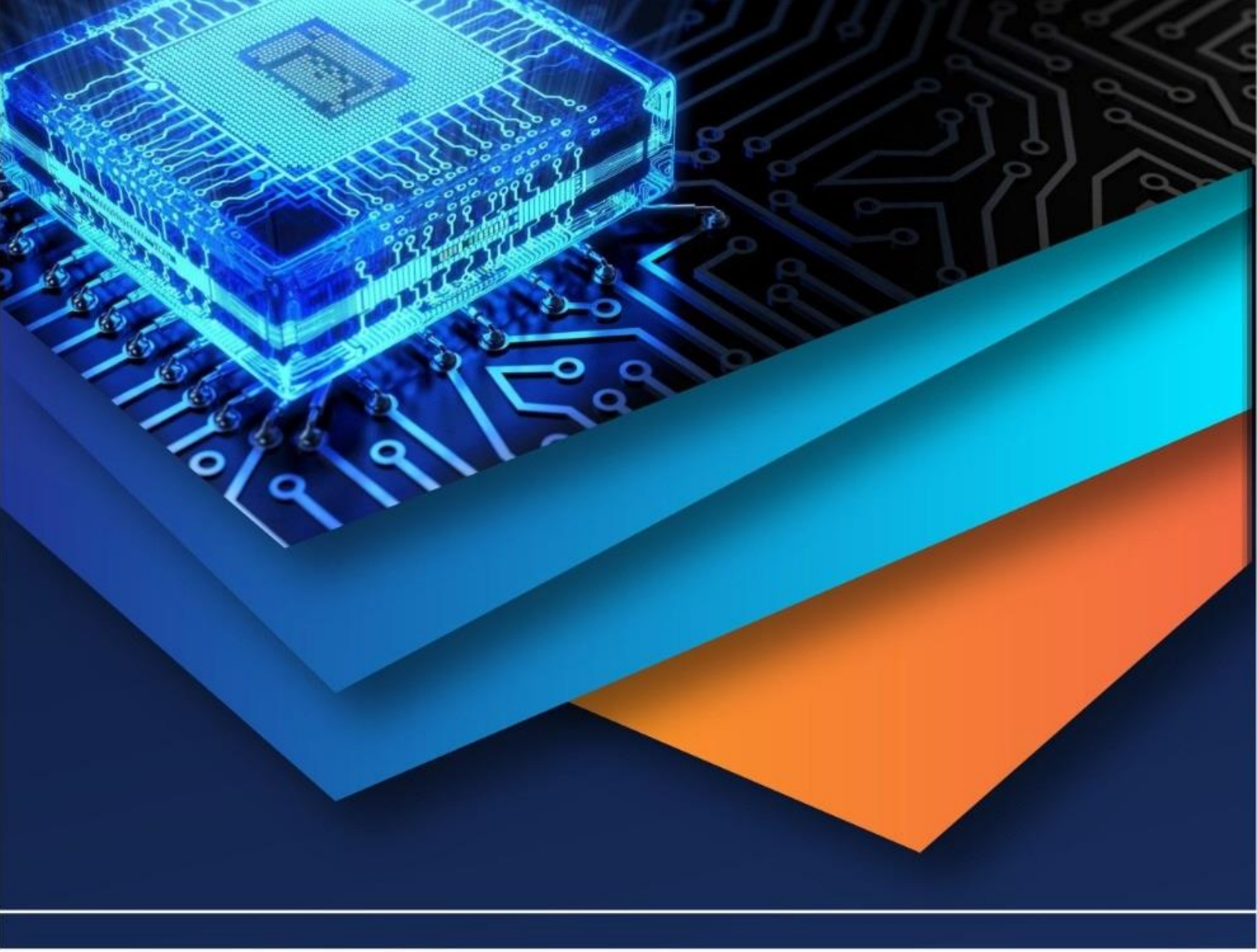
[6] N.Sriskanthan, F. Tan and A. Karande, "Bluetooth based home automation system", Microprocessors and Microsystems, vol. 26, no.6, (2002), pp. 281-289.

[7] K. Gill, S.-H. Yang, F. Yao and X. Lu, "A Zig-Bee-based home automation system", IEEE Transactions on Consumer Electronics, vol. 55, no. 2, (2009), pp. 422–430.

[8] N. Kushalnagar, G. Montenegro and C. Schumacher, "IPv6 over low-power wireless personal area networks (LoWPANs): overview, assumptions, problem statement, and goals", RFC 4919, (2007).

[9] M. Kovatsch, M. Weiss and D. Guinard, "Embedding internet technology for home automation", In Proceedings of the 15th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA '10), (2010) September.

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)