

## SMART HOME

<sup>1</sup>B.SURESH RAM, <sup>2</sup>G.KARTHIK REDDY, <sup>3</sup>P.MAHESH BABU, <sup>4</sup>BHARATH, <sup>5</sup>GANESH

<sup>1</sup> Assoc. Prof, Dept. of ECE, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

<sup>2</sup>Asst.Prof, Dept. of ECE, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

<sup>3</sup>Asst.Prof, Dept. of MECH, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

<sup>4-5</sup>B-TECH, Dept. of CSE, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

### Abstract

The modern home automation system gives security & blissful life at residence. That is why popularity of using home automation technology is increasing day by day. The project aims in designing a system which makes operating of electrical appliances in home through Android mobile phone possible. The controlling of electrical appliances is done wirelessly through Android smart phone using the Bluetooth feature present in it. Here in this project the Android smart phone is used as a remote control for operating the electrical appliances. Android boasts a healthy array of connectivity options, including Wi-Fi, Bluetooth, and wireless data over a cellular connection (for example, GPRS, EDGE (Enhanced Data rates for GSM Evolution), and 3G). Android provides access to a wide range of useful libraries and tools that can be used to build rich applications. In addition, Android includes a full set of tools that have been built from the ground up alongside the platform providing developers with high productivity and deep insight into their applications. Bluetooth is an open standard specification for a radio frequency (RF)-based, short-range connectivity technology that promises to change the face of computing and wireless communication. It is designed to be an inexpensive, wireless networking system for all classes of portable devices, such as laptops, PDAs (personal digital assistants), and mobile phones. It also will enable wireless connections for desktop computers, making connections between monitors, printers, keyboards, and the CPU cable-free. We will be using Bluetooth in our project.

### 1. INTRODUCTION

Home automation system makes the operations of various home appliances more convenient and saves energy. With the energy saving concept, home automation or building automation makes

life very simple nowadays. It involves automatic controlling of all electrical or electronic devices in homes or even remotely through wireless communication. Centralized control of lighting equipments, air conditioning and heating, audio/video

systems, security systems, kitchen appliances and all other equipments used in home systems is possible with this system. This system is mainly implemented by sensors, controlling devices and actuators as shown in the figure. The sensors detects light, motion, temperature and other sensing elements, and then send that data to the main controlling devices. These sensors can be thermocouples or thermisters, photo detectors, level sensors, pressure sensors, current transformers, IR sensors, etc., which need an additional signal conditioning equipment to communicate with the main controller. Controllers may be personal computers/laptops, touch pads, smart phones, etc., attached to the controlling devices like programmable-logic controllers that receive the information from the sensors, and based on the program, control the actuators. This program can be modified based on the load operations. The programmable controller allows to connect various sensors and actuators through various input and output modules whether they are analog or digital. Actuators are the final controlling devices like limit switches, relays, motors and other controlling mechanisms which finally control the home equipments.

Communication plays an important role in this home automation system for the remote access of these operations. This smart home system also provides continuous monitoring through video surveillance with cameras, scheduling, and energy saving operations. This is the best solution even for the elderly and the disabled persons to operate equipments.

## 2. RELATED WORK

The research paper which we referred to was Smart Home Automation System Using on IOT, which was published in International Journal of Scientific and Engineering research in June 2020. Written by Diponkar Kundu, Md. Ebrahim Khallil & 3 other authors. The components used in the research papers for home automation were Raspberry-Pi, PIR sensor camera & various internet of things related components. In countries like India were there are more middle class people using such more heavy & costly devices, components will make our project more costlier. Inorder to make I our buissness model more affordable we will be using Arduino uno micro controller board & Bluetooth module. The microcontrollers are user friendly and can be operated by anybody without any trouble. Also less manual intervention is required for

operating the microcontrollers, which reduces labour cost. The microcontroller base programmed home automation interface displayed in this venture is obliged to satisfy the necessity of advances "tomorrow will be more exceptional than today".

### 3. IMPLEMENTATION

The main problem is that, people are nowadays buying electrical appliances which are smart enough, which can be operated through smart phones but these appliances are costly. ex fans & lights which can be operated through smart phones are costly than compared to normal ones. The percentage of smart homes in the US is around 12% and when it comes to india, it will not even be around 0.1% as majority of its population cant afford them So its better to interface these devices with our proposed solution than buying these costly appliances which are smart enough. Our project aims in designing a system which makes operating of electrical appliances in home through Android mobile phone possible. The controlling of electrical appliances is done wirelessly through Android smart phone using the Bluetooth feature present in it. Our proposed solution consists of a Arduino board and a Bluetooth module. Various

appliances are connected to the relay which is interfaced with Arduino board through smart phone connected to the Bluetooth module. Signals can be passed based on requirement. Through this signals those appliances can be operated. The controlling device of the whole system is a Microcontroller. Bluetooth module, Relay board and GLCD display are interfaced to the Microcontroller. The data received by the Bluetooth module from Android smart phone is fed as input to the controller. The controller acts accordingly on the Relays to switch connected electrical appliances. Also, the status of the electrical appliances can be seen on GLCD display. (If the electrical appliance is turned on and simultaneously turned off the status can be seen on GLCD display). In achieving the task the controller is loaded with a program written using Embedded 'C' language. The "BLUETOOTH TERMINAL HC-05 APP" app is used to connect it to the Bluetooth module. Relays are connected to the electrical appliances which act as circuits/switches. What is a smart home? That seemingly simple question has many answers, depending on who you ask. In short, though, a "smart home" is a residence equipped with devices that automate tasks normally

handled by humans. These can be built into the structure itself or added later. Homeowners operate them using apps, voice commands, remotes and switches, or artificial intelligence. For some people, turning a house into a smart home can be as simple as buying a connected speaker. For others, it can involve linking many categories of products, including speakers, cameras, computers, smartphones, tablets, televisions, security systems, appliances, and more. The main problem is that, people are nowadays buying electrical appliances which are smart enough, which can be operated through smart phones but these appliances are costly. ex fans & lights which can be operated through smart phones are costly than compared to normal ones. The percentage of smart homes in the US is around 12% and when it comes to india, it will not even be around 0.1% as majority of its population cant afford them So its better to interface these devices with our proposed solution than buying these costly appliances which are smart enough

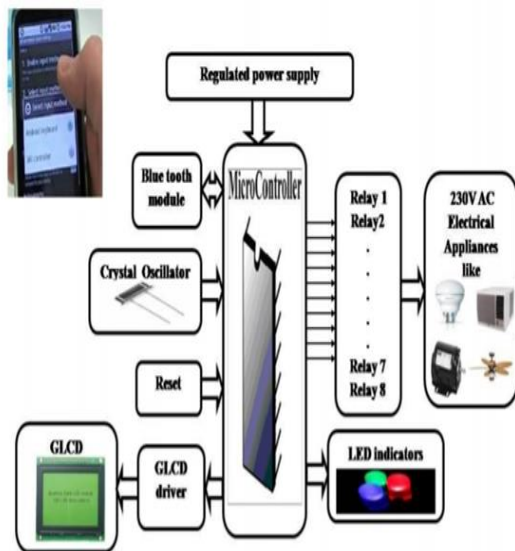
### **Purpose**

Its objective is to improve the quality of life and convenience in the home, as well as residents' safety and security. Smart

home applications also often ensure more efficient use of energy.

### **Scope**

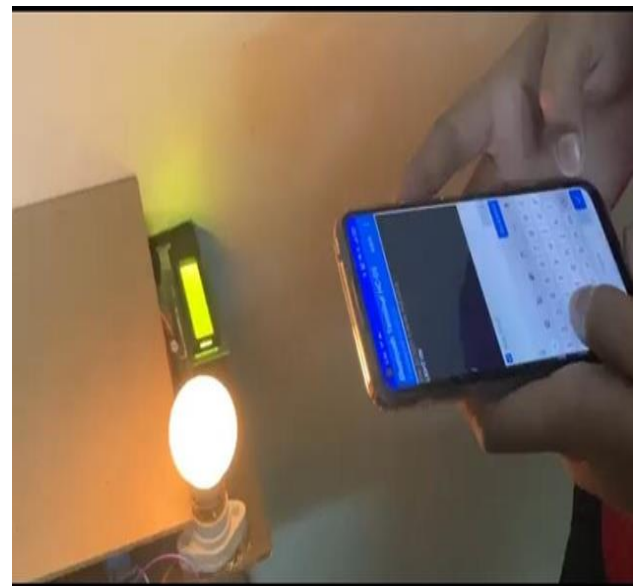
Home of the future is a space for the digital natives. With the invention of lots of automation technologies featuring IOT and AI, home automation has become a reality. One can implement several of their tasks with just a single command of verbal instructions. These technologies can used to build fully functional home automation system and control smart home devices including smart lights, connected thermostats, and appliances. One can build several amazing projects using the concepts of home automation. There are several projects already done by developers and available on the Internet. They might help you to start the work with IoT. You can add new skills to own smart device. You can make your smart home device work according to your life works and habits. Even we can build many projects around it by discovering new areas of the internet of things and make the world a smarter place to live in.



#### 4. EXPERIMENTAL RESULTS

Our proposed solution is to make interface which works as smart home integrated with microcontroller board and a Bluetooth module .. This interface can be integrated with upto 8 Relays or in other words it can be integrated with 8 appliances based on requirement.. Our proposed solution has a a Bluetooth module. So it can be connected to a smart phone and signals can be transferred through that bluetooth module!!Our proposed design also comes up with 20\*3 GLCD which displays the status of appliance connected to our interface whether it's in use or not!!Our proposed solution consists of a Arduino board and a Bluetooth module. Various appliances are connected to the relay which is interfaced with Arduino board through smart phone connected to the Bluetooth module signals

can be passed based on requirement. Through this signals those appliances can be operated, The controlling device of the whole system is a Microcontroller. Bluetooth module, 8-Relays board and GLCD display are interfaced to the Microcontroller. The data received by the Bluetooth module from Android smart phone is fed as input to the controller. The controller acts accordingly on the Relays to switch connected electrical appliances. Also, the status of the electrical appliances can be seen on GLCD display. In achieving the task the controller is loaded with a program written using Embedded 'C' language.



#### 5. CONCLUSION

Home Automation is undeniably a resource which can make a home environment automated. People can

control their electrical devices via these Home Automation devices and set up controlling actions through mobile app. In future this product may have high potential for marketing. Old people can make use of this technology and they will not be needing anymore to walk up the stairs to switch of the terrace lights or the water pump; now it can be done sitting in your bedroom just by a touch on their Smartphone...

## 6. REFERENCE

1. Premalatha, B., Srikanth, G., Abhilash, G., "Design and Analysis of Multi Band Notched MIMO Antenna for Portable UWB Applications", *Wireless Personal Communications*, 2021, Vol. 118-Issue 2, PP-1697-1708.
2. Saba, L., Sanagala, S.S., Gupta, S.K., Koppula, V.K., Johri, A.M., Sharma, A.M., Kolluri, R., Bhatt, D.L., Nicolaides, A., Suri, J.S., "Ultrasound-based internal carotid artery plaque characterization using deep learning paradigm on a supercomputer: a cardiovascular disease/stroke risk assessment system", *International Journal of Cardiovascular Imaging*, 2021, Vol. 37-Issue 5, PP.1511-1528.
3. Kumar Dash, C.S., Behera, A.K., Nayak, S.C., Dehuri, S., "QORA-ANN: Quasi Opposition Based Rao Algorithm and Artificial Neural Network for Cryptocurrency Prediction", 2021 6th International Conference for Convergence in Technology, I2CT 2021, 2021, Vol. ,Issue, PP.
4. Merugu, S., Tiwari, A., Sharma, S.K., "Spatial Spectral Image Classification with Edge Preserving Method", *Journal of the Indian Society of Remote Sensing*, 2021, Vol. 49-Issue 3, PP-703-711.
5. Nair, D.V., Murty, M.S.R., "Fault tolerant-based virtual actuator design for wide-area damping control in power system", *Electrical Engineering*, 2021, Vol. 103-Issue 1, PP-463-477.
6. Debnath, S., Talukdar, F.A., Islam, M., "Combination of contrast enhanced fuzzy c-means (CEFCM) clustering and pixel based voxel mapping technique (PBVMT) for three dimensional brain tumour detection", *Journal of Ambient Intelligence and Humanized Computing*, 2021, Vol. 12-Issue 2, PP-2421-2433.

7. <http://cloudstechnologies.in/project/ece-live/arduino->
8. <https://timesofindia.indiatimes.com/blogs/voices/smart-home-automation-a-reality-of-today/>
9. <https://create.arduino.cc/projecthub/amrmostaafaa/how-to-build-a-diy-arduino-based-smart-home-hub-with-1sheeld-79d405>
10. <https://predictabledesigns.com/home-automation-with-an-arduino-a-basic-tutorial/>
11. [https://www.researchgate.net/publication/342497329\\_Smart\\_Home\\_Automation\\_System\\_Using\\_on\\_IoT](https://www.researchgate.net/publication/342497329_Smart_Home_Automation_System_Using_on_IoT)