iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 **Issue:** II **Month of publication:** February 2018

DOI:

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: 6.887
Volume 6 Issue II, February 2018- Available at www.ijraset.com

IoT based Implementation of Smart Home Automation and Security System using Raspberry Pi

Prof Amruta Nikam[1], Rajdeep Malakar[2], Akriti Ranjan[3], Kajal Kumari[4]
[1]*Assistant Professor at Dr. D.Y. Patil Institute of Engg, Mgmt & Research, Akurdi, Pune, India*
[2,3,4]*UG Student , Dept. of E&TC, at Dr. D.Y. Patil Institute of Engg, Mgmt & Research, Akurdi, Pune, India*

Abstract*: *Home automation is being accepted nowadays because of its uncountable benefits. Home automation is usually carried out by remote control or local networking. This project focuses on designing a application which will be very simple and easy for home automation as well as a security system on Raspberry Pi. The codes of the same are generated in python environment which is by default programming environment of Raspberry Pi. LED's are used as an indication for the switching action. Home automation system can also be implemented on Raspberry Pi which includes a smart doorbell, locking system, automated lighting system, temperature & humidity controller which turns on fan or air conditioner automatically or increases the speed of the fan automatically under the given conditions. The later part of the project focuses on the security system which includes gas and smoke detectors which will work in case of a gas leakage and fire respectively. In case of a gas leak or fire, windows of the house will be opened automatically and also an alert message will be sent through SMS to the user. The doors, windows, lights, fans and other household appliances will also be controlled from any point of the world by the user through cloud services or android applications. Python codes are required for interfacing each senses and a prototype of smart home can be developed.

Keywords: Raspberry Pi, Python, Sensor, Interface, LED, SMS

I. INTRODUCTION

Basically home automation refers to the working of information technology and computer in order to have an access on home appliances as well as monitor them. The applications ranges from simple remote control of lighting system to much intricate microcontroller and networks including various stages of automation and intelligences. There are several kinds of advantages in home automation such as ease of use, energy proficiency and safer major which results better standard of life. The demand of security system and network permitted home automation is swelling in past few years because of advantages like comfort ability, ease of use, clarity and highly economical. Besides having a quick increase in the field of internet, there is still a lot more potential for remote controlling and supervising such devices from anywhere in the world using the concept of IoT. In 1975, the XIO industry standard was introduced for communication between electronic devices. It is one of the historic standard recognised from the author's point of view, providing restricted authority over household devices through the power lines.

II. RASPBERRY PI

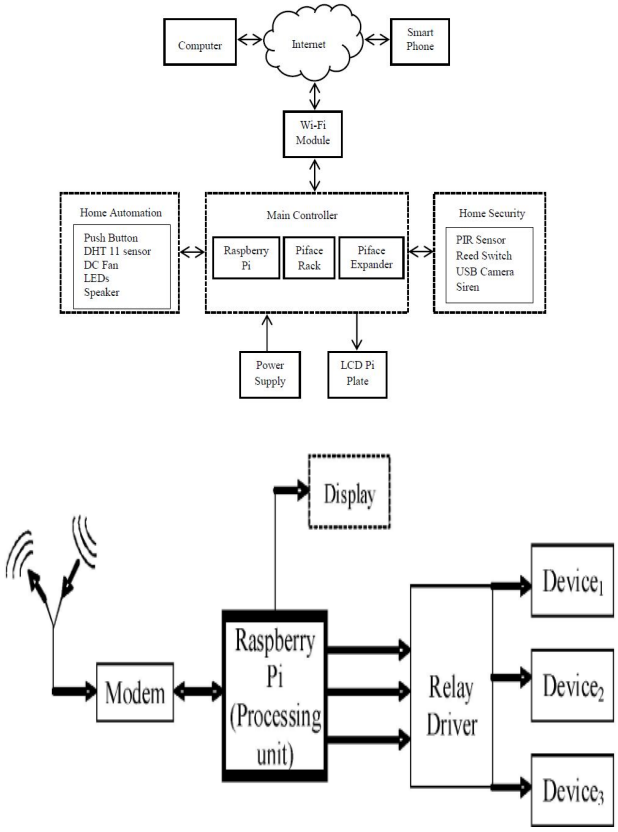
The raspberry pi is basically a micro computer which is capable of doing almost everything that our normal PCs and laptops can do. It was invented in United Kingdom few years ago by Raspberry Pi foundation, in order to give basic knowledge about computer science in schools and colleges. It has been popular since the launch of its first model i.e. raspberry pi 1. It became popular due to its ease of use. Basically it consists of a HDMI port, a SD card *port*, Ethernet port, Wifi, 4 USB ports, and also a camera. It was used for applications such as robotics and embedded applications. General peripherals like mouse and keyboard are actually not included with the raspberry pi unlike PCs. It has to be bought separately and installed. However some official and unofficial bundles include some accessories.

III.SETTING UP THE RASPBERRY PI

Unlike other computers the raspberry pi does not have an OS pre-installed in it. So to make it work, first we have to install the operating system. The things that we are going to need are : Raspberry Pi(any model), card reader, 8 GB Micro SD card, HDMI to VGA converter, monitor & USB cable. First we have to enter the SD card into the card reader & then connect the card reader to our PC. Then we will open up any internet browser and go to www.raspberry,org from where we can download the

"Raspbian" operating system. There is other operating systems which we can install but we will stick on to Raspbian because it was developed exclusively for raspberry pi. We will be downloading the Raspbian Jessie by a torrent client. In addition to this we will need to download some softwares which we will need to decompress the OS, create a image file and also to write onto the SD card. First we will have to download 7zip to decompress the OS downloaded. Then we need to download a software called WIN32 DISK IMAGER which creates a image file and also writes the OS on the SD card. First we have to extract the downloaded OS in a folder by which a image file will be created. Then we have to open up win 32 disk imager and choose the image file and also specify the device where we want to write the image file. In this case we are writing into the microSD card. After we are finished writing the image file into your SD card, we will see that our untitled SD is renamed "boot" automatically which contains all the files of the operating system. Now the SD card is ready to be installed into the raspberry pi. After inserting the SD card we can boot or power on the raspberry pi using the USB cable. Then we have to connect the HDMI port to the monitor. We also have to connect the keyboard and the mouse into 2 USB ports. Booting up for the first time takes some time. After booting up, first thing we need to do is configure the raspberry pi. For that we need to open up terminal, and run the command sudo raspi-config. It will open up a screen where we need to configure all things like time, etc. After the configuration is done, it will reboot. And then, the raspberry pi is ready to run.

IV. BLOCK DIAGRAM AND ARCHITECTURE OF THE SYSTEM



V. OBJECTIVES

A. Designing a basic automated home using Raspberry Pi. (Making the home appliances and devices absolutely automatic.)
B. Controlling household appliances and devices from anywhere through cloud by implementing the concept of IoT.
C. The system will also be able to control the home appliances with respect to change in temperature or humidity.
D. Providing a 24 hour monitoring and security alert system.(A 24x7 monitoring and security alert system by the use of sensors and also sending notifications to the user through SMS.)
E. Providing an automatic door locking and unlocking system.
F. Designing an automatic security system in case of any accident.

VI. RELATED WORK

The work of Arum Cyril Jose and Reza Malakian clarifies several security problems in current home automation systems, they suggest the security system which is logic based to advance home security. It stretches detail of natural penetrating points of a home as principal and subordinate penetrate points contingent of their usage. Logic-based detection can be achieved by detecting typical user action at these penetrate points and demanding operator verification when required. Operator location can similarly be acknowledged once various penetrate points positions are changed. Additionally, the algorithm correspondingly confirms the validity of a fire alarm by the determination of variation in temperature, moisture and CO stages. This testing uses sensor, Rasp. Pi, ZigBee and microcontrollers communication as a combination to classify operator behaviour at several penetrate points and then execution of logical sensing system. According to them, logical sensing system was tested by implementing fruitfully for month. Throughout the procedure of experiment, this algorithm can see the state variations on the operator principal and subordinate penetrate points and also fruitfully confirmed operator individuality many times producing some alarms and warnings.

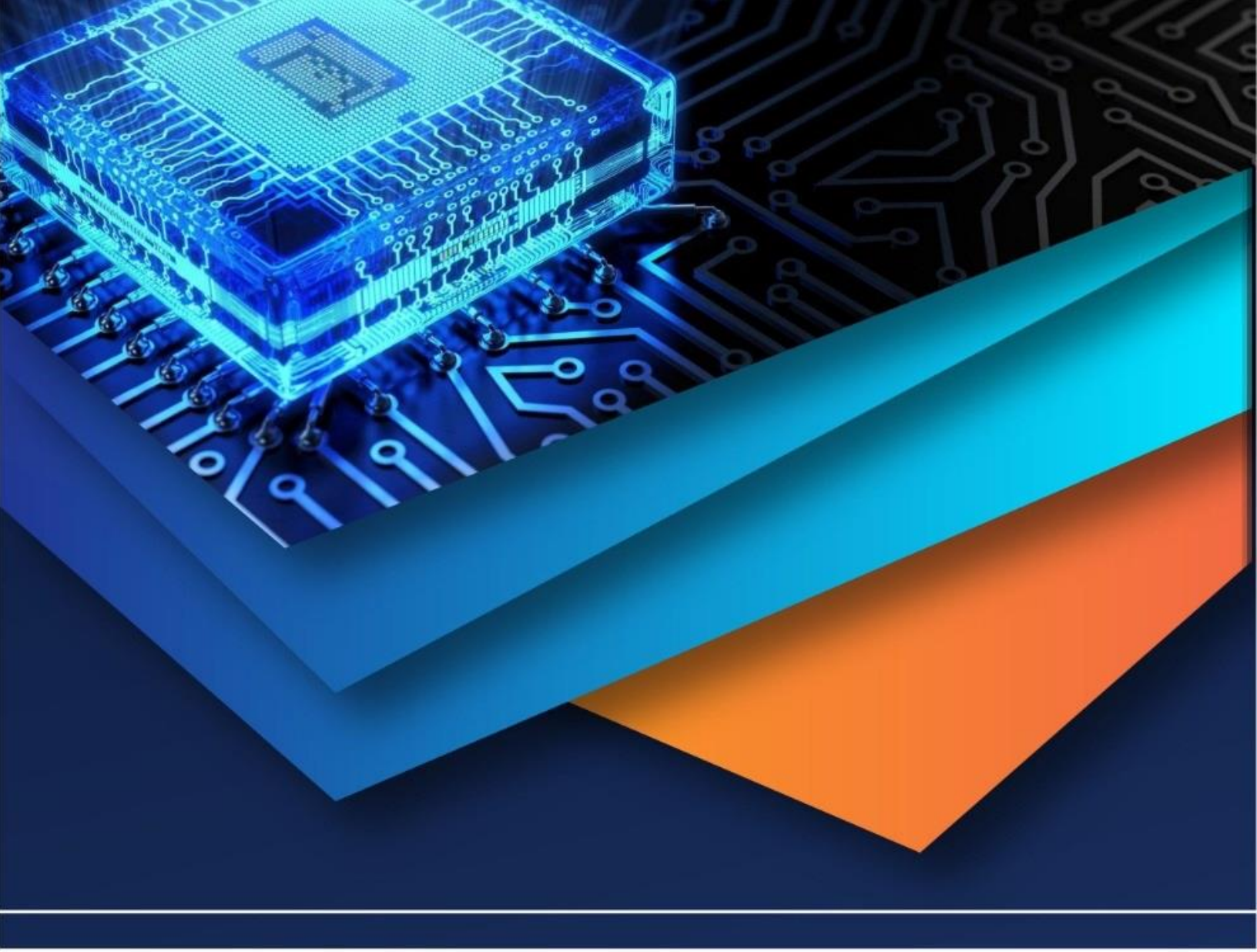
Ching-Chuan Wei, Chi-Han Yu, Chao-Chieh Chang and Yan-Ming Chen presents a study of the Z-Wave wireless transmission and mobile devices based smart home control system to understand lock control remotely by electronic. This arrangement can be done by Raspberry Pi.

VII. CONCLUSION

Thus it can be concluded that this project aims in designing a basic system where we will be able to control as well as monitor the household appliances from any part of the world through the combined uses of Wi-Fi, Internet, Sensors And Graphical User Interface. Also in case of an accident, the system will be able to send notification to the user as well as control it to a certain extent.

REFERENCES

[1] Improving Smart Home Security: Integratings Logical Sensing Into Smart Home.(Arun Cyril Jose and Reza Malakian ,Senior Member,IEEE)
[2] The Implementation of Smart Electronic Locking System Based on Z-Wave and Internet. (Ching-Chaun Wei, Dept. of Info. & Comm. Engg. CYUT Taichung, Taiwan) (Yan-Ming Chen, Dept. of Info. & Comm. Engg. CYUT Taichung, Taiwan) (Chao-Chieh Chang, Dept. of Info. & Comm. Engg. CYUT Taichung, Taiwan) (Chi-Han Yu, Dept. of Info. & Comm. Engg. CYUT Taichung, Taiwan)
[3] IoT-based Home Automation System for People with Disabilities. (MohdHelmyAbdWahab Embedded Computing Research Group Faculty of Electrical and Electronic Engineering UniversitiTun Hussein Onn Malaysia P.O. Box 101, Pt. Raja, BatuPahat, *helmy@uthm.edu.my)
[4] Home Automation and Monitoring System Using Raspberry Pi and Android. (1Prof. Vaidya Bhaumik, 2Prof. Niteen B Patel, 3 Vardhman Modi 1 Assistant Professor, 2 Associate Professor, 3Student 1 Electronics and Communication Department, 1 SCET, Surat, India).
[5] Smart Home Automation: A Literature Review. (1. Vaishnavi S. Gunge, Walchand Institute of Technology, Solapur. 2. Pratibha S. Yalagi, Walchand Institute of Technology, Solapur.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY