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IOT Based Home Automation and Surveillance System

Shweta T. Meshram¹, Bhagyashri M. Katwe², Shweta S. Rangari³, Shital D. Lohambare⁴, Assistant. Prof. V.V.Panchbhai⁵

Student, Dept. of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur, Maharashtra, India

Student, Dept. of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur, Maharashtra, India

Student, Dept. of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur, Maharashtra, India

Student, Dept. of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur, Maharashtra, India

Assistant professor, Dept. of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur, Maharashtra, India

ABSTRACT: Home automation and surveillance system refers to the branch of automation that deals with the technique committed to lowering of human efforts. Increase safety and monitor activity on properly. There are lots of devices on the market for the automation of home such as Bluetooth, android app, zig-bee, Wi-Fi module. In this technology we are using raspberry pi and Wi-Fi module for providing remote control on electrical home appliances, when the homeowner is away from the home. The main aim of this home automation and surveillance system using Internet of things is to design a smart and safe home which can be controlled and monitored by raspberry pi via Internet of thing.

KEYWORDS: Home automation , IOT , Raspberry pi

I. INTRODUCTION

Automation is the transformation of work process, a procedure or equipment to automatic rather than any human interference. To save energy, monitor activity of homes and for safety of home automation is needed. CCTV provides the best security and surveillance Now day one can monitor the home which they are away from the home with the help of internet of thing. Home automation application varies from a simple control of lightning to complex microcontroller based network. Raspberry pi is qualified for house controller, consuming power, size and cost. The home automation aim to control and operate electrical appliances. It offers a lot of flexibility over the wired system. It comes with various advantages like ease-of installation, ease-of-use and avoid the complexity. With combining the technology with home, we build an awesome home.

II. RELATED WORK

In the paper of Vinay Sagar et.al. proposed system they have written about the project of HAS using IOT wherein they have used Intel Galileo Microcontroller. They have used Wi-Fi as a medium for internet connectivity. Home automation is an important milestone in achieving smart grid and is ever exciting field that has exploded over the past

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few years. Advancement in technologies have made homes more convenient, efficient and even more secure. Introducing the Raspberry Pi to the world of home automation provides numerous customizations to turn a regular home into a smart home. Raspberry Pi provides a low cost platform for interconnecting electrical/electronic devices and various sensors in a home via the internet network. The main objective of present work is to design a smart home which can be controlled and monitored by the Raspberry Pi via the Internet of Things (IOT). This will help the home owners to provide a simple, fast and reliable way to automate their environment. This paper focuses on home automation. This paper deals with the design and implementation of Raspberry pi based IOT concept it means internet of things. In this present generation everything is going on internet itself. So in this project we concentrate totally on the present generation life how they can get security to their home or office and control the devices by using android app just by using internet in there smart phones. The main security is provided by camera module which captures the images and uploads into the internet and also stores the same images in Raspberry pi module SD card. Raspberry pi acts like a small minicomputer it is totally a Linux platform. By just connecting mouse and keyboard we can operate it as minicomputer where we can play games, play videos etc just like our personal laptop work. And also the WI-FI module is used in this project to control the devices from remote location also by getting the status of the devices into smart phone android app everything is going on internet itself our day to day life. Future generation will work on internet itself by sitting in one place we can do anything on internet.

III. PROPOSED SYSTEM

The block diagram of Home automation system is as shown in Fig.1. In the implementation of home automation using raspberry pi the mobile device play an important role. The mobile technology provide essential surveillance to our home and make it smart.

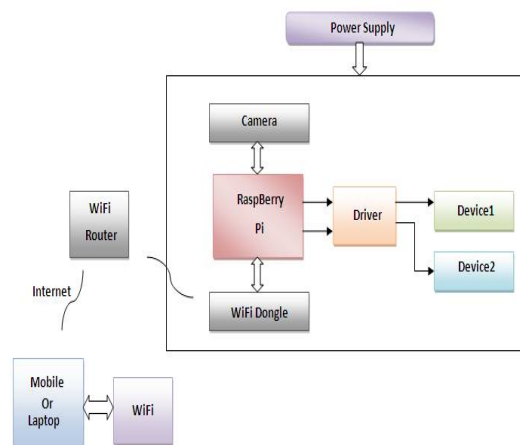


Fig.1 Block diagram of Home Automation System

When the motion is detected the Raspberry Pi device alerts the home owner. The Raspberry pi kit board has wireless connection that to the internet hub. The internet work as a master since the whole project is control online. For initialization the user has to login in mobile device and then operates to control various appliances. And they indicate the status is online, and then they enter the password. Than in status board there is written closed means someone is there, and when in front of our door any motion or obstacles are acquire that time click an snapshot than image capture . And the transmitter part is as shown in fig.1

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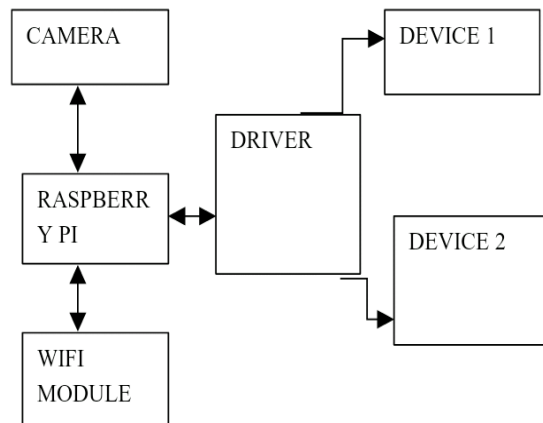
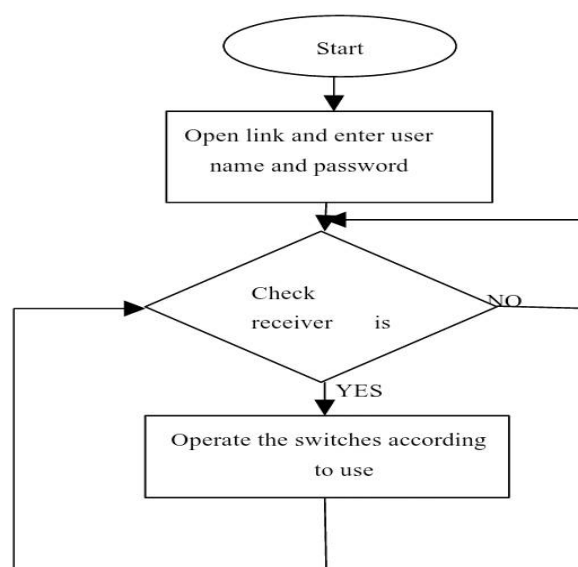


Fig. 2 Receiver section

The block diagram of Home automation system as shown in Fig.1, consist of Bulb IR sensor, USB Web camera , Raspberry pi3 ,bulb first we install the raspberry pi setup and take our IOT in raspberry mode and there is one IR sensor is used to detect obstacles. After detecting the person is in front of the door the IR sensor sense and send the signal to the transmitter. When transmitter receive that signal and with the help of Web camera it will capture the image.

Flow chart :

Fig.6 shows the working flow of IOT based home automation and surveillance system. Firstly we have to open <http://www.rasptium.de/IOT/IOT-status.pl> this link.



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HARDWARE DESCRIPTION: RASPBERRY PI

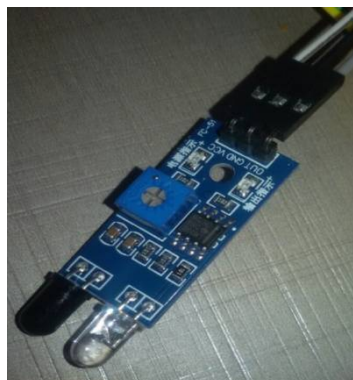


Fig.3 Raspberry pi3 B kit

In this system Raspberry Pi 3 Model B is used. It is the third generation Raspberry Pi .This powerful credit card size single board computer can be used for many application and supersedes the original Raspberry Pi Model B and Raspberry P2 Model B. While maintaining the popular format the Raspberry Pi 3 Model B brings a more powerful processor ,10x faster than the first generation Raspberry Pi. Additionally , it adds wireless LAN and Bluetooth connectivity making it the ideal solution powerful connected design.

IR OBSTACLE SENSOR

The IR Obstacle Detection sensor from Robot Base is specifically designed for robust indoor operation. The sensor module employs a modulated LED light source and a tuned receiver to detect if the radiated IR light is reflected back to the sensor. When this happen , the on board LED light and the output signal S is set to low.



WEB CAM

Web cam is a video camera that feeds its image in real time to or throw a computer network. When captured by the computer to a computer network it is a medium web cam offering 640*480 resolution .

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Fig.5 Web-Camera

TESTING OF SYSTEM:

FROM SAME PLACE

Network	ON Time (sec)	OFF Time(sec)
2G	5	5
3G	7	8
4G	12	11

FROM ANOTHER PLACE

Network	ON Time (sec)	OFF Time(sec)
2G	2	3
3G	10	11
4G	28	25

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Fig.7 When system is offline .

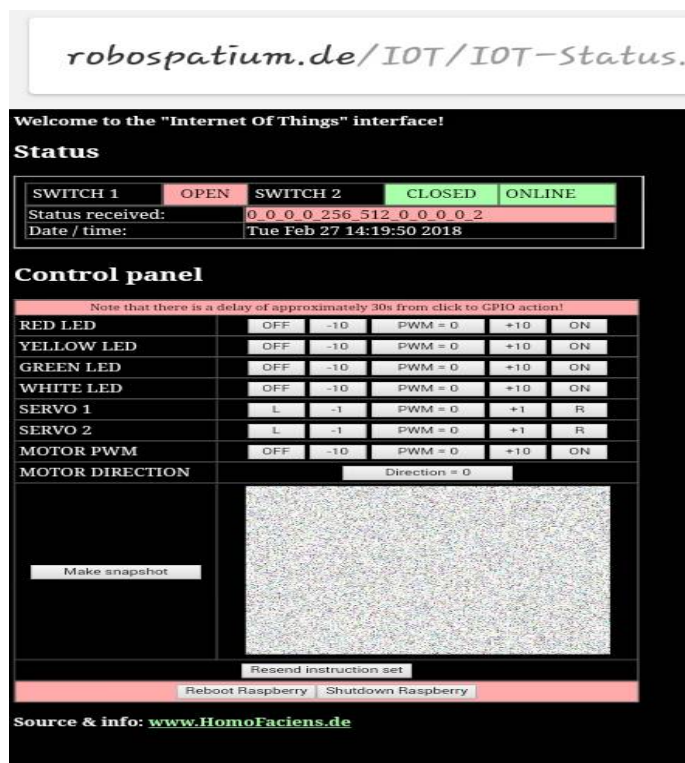


Fig.8 After entering the password the status will be change from offline to online .

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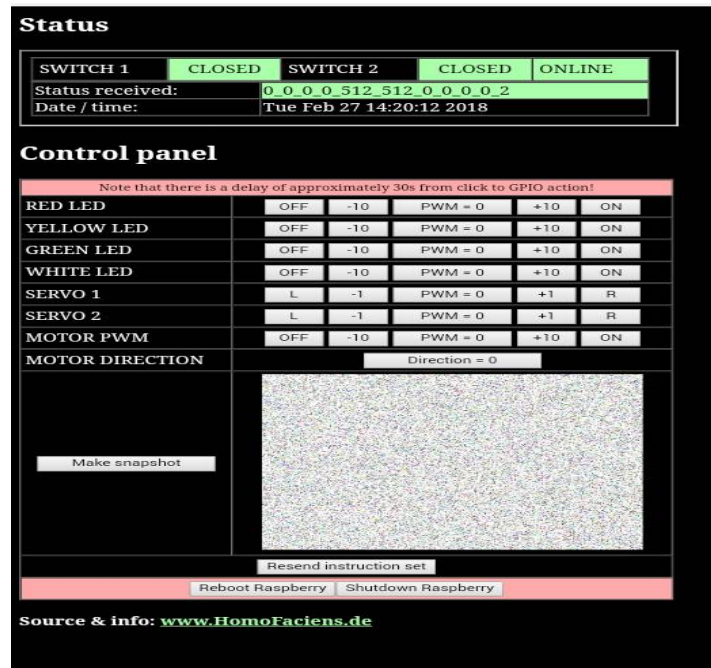


Fig .9 If any object come in front of IR sensor it will show the closed status.

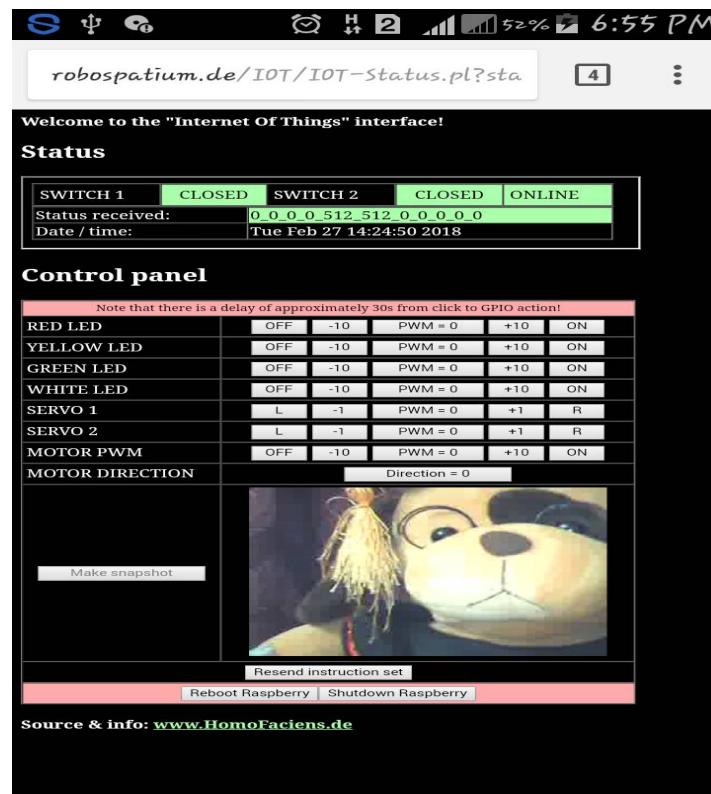


Fig.10 after taking snapshot .



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IV. CONCLUSION

In this project we have successfully designed IOT based smart security and home automation control. That provide a user friendly home automation and security application for home. These system are useful because human can make mistake and forget to switch off the appliances when in no use and in such cases the system is useful in order to utilize the power effectively and also in secured manner.

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BIOGRAPHY



Shweta T. Meshram ,BE final year student ,Dept. of Electronics and Telecommunication Engineering , Priyadarshini College of Engineering, Nagpur.



Bhagyashri M. Katwe, BE final year student, Dept. of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur.



Shweta S. Rangari, BE final year student, Dept. of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur.



Shital D. Lohambare, BE final year student, Dept. of Electronics and Telecommunication Engineering, Priyadarshini College of Engineering, Nagpur.



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Vishal V. Panchbhai has received B.E. in Electronics & Telecommunication Engineering from Dr. B.A.M.U., Aurangabad, Maharashtra, INDIA in 2004, M.E in Electronics Engineering from Dr. B.A.M.U., Aurangabad, Maharashtra, INDIA in 2007. He has more than 10 years of experience in teaching. Currently working as Assistant Professor in Electronics & Telecommunication Department at Priyadarshini College of Engineering, Nagpur, INDIA. His areas of interest are Image Processing and Embedded System.