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REVIEW PAPER ON HOME AUTOMATION AND SECURITY USING IOT**Prof. S. S. Mhaske^{*1}, Rupali J. Nirmal², Dr. C. M. Jadhao³ & Prof. P. S. Nimat³**
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ABSTRACT

Home Automation and security is essential for occupants' convenience and protection. This paper aims at automating home appliances and providing sensor based security using Wi-Fi protocol. There are many protocols for communication and data transfer like Zig Bee, Bluetooth, Z-wave and GSM but all these have range issues so here we are using internet for data uploading. This paper sheds the light on implementation of home automation and security system using raspberry pi kit, pi camera and different sensors like gas, ultrasonic, motion, etc. This paper analyses the feasibility, reliability, preciseness and lacunas of this home security system using IoT. IOT offers very large potential for development of various types of automation, this paper also deals with the design and implementation of Raspberry pi based home automation and security using IOT concept. Home security can be enhance by monitoring home through different sensors and cameras, it all can be visible on mobile too. This home appliance and security system differs from other system by allowing the user to operate the system from anywhere around the world through internet connection. The interfaces built into its GPIO connector make it easy to bolt on modules using simple low cost electronics and bit of configuration to create very functional system.

Keywords: *IoT, Pi camera, Raspberry pi kit, Sensor, Buzzer.*

I. INTRODUCTION

A home automation system is a technological solution that enables automating the bulk of electrical, electronics and technology-based tasks within a house. It uses a combination of hardware and software technologies that enable control and management over appliances and devices within a house. Monitoring and control devices and linking of appliances used in home through an intelligent network over a medium such as electrical power wiring, infrared, coaxial cable, spread spectrum technology or radio frequency coordinated by a computer. Smart home security has become absolutely worst in daily life of home hold and industrial works. Home security is something that is applicable to all of us and allude the hardware and a personal security practice. The hardware would be the doors, alarms, lock systems and different type of sensors like, PIR motion sensor acoustic sensor etc.to detect unfavorable condition.[1] As we know that today world is progressing very fast, things are becoming easy then before. People are considering the automatic devices instead of manual devices. They just want an easier approach to some device. This field of automation is growing very fast. Internet is the basic part of the world's communication. It is also being used to communicate between the devices to operate accordingly. For the last few decades the use of internet has enormously increased. Internet of things is a field in which you can share all your required information from your specified file even when you are busy. It can access every information from a mini gadget to complete industry. Internet of things based home automation and security system is a system in which you can control the each and every object of your home form any part of the world by using internet through your mobile phone or your personal computer and you can also collect the As we know that today world is progressing very fast, things are becoming easy then before. People are considering the automatic devices instead of manual devices. They just want an easier approach to some device. This field of automation is growing very fast. Internet is the basic part of the world's communication. It is also being used to communicate between the devices to operate accordingly. For the last few decades the use of internet has enormously increased. Internet of things is a field in which you can share all your required information from your specified file even when you are busy. It can access every information from a

mini gadget to complete industry. Internet of things based home automation and security system is a system in which you can control the each and every object of your home form any part of the world by using internet through your mobile phone or your personal computer and you can also collect the information related to atmospheric condition from your home Like temperature, humidity etc. And with this there is another Application to secure your home from any theft or hazard. [2]

II. PROPOSED SYSTEM

The block diagram of Home automation and security system is as shown in Fig.1. In the implementation of home automation using raspberry pi the mobile phone device play an important role. The mobile technology provide essential surveillance to our house and make it smart home. 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 and snapshot than image capture the transmitter part is as shown in fig.1 The block diagram of Home automation system as shown in Fig.1, consist of Bulb IR sensor, Pi 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 Pi camera it will capture the image As we know that today world is progressing very fast, things are becoming easy then before. People are considering the automatic devices instead of manual devices. They just want an easier approach to some device

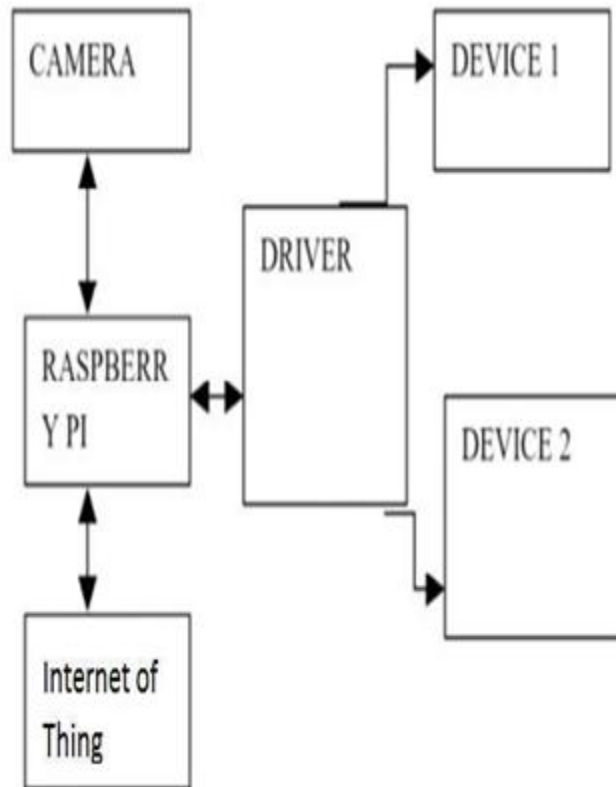


Fig. Block diagram of Home Automation & Security

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enormously increased. Internet of things is a field in which you can share all your required information from your specified file even when you are busy. It can access every information from a mini gadget to complete industry. Internet of things based home automation and security system is a system in which you can control the each and every object of your home form any part of the world by using internet through your mobile phone or your personal computer and you can also collect the information related to atmospheric condition from your home Like temperature, humidity etc. And with this there is another Application to secure your home from any theft or hazard.

III. HARDWARE IMPLEMENT

PIR sensor:

PIR sensor is an optoelectronic sensor which works on the principle of light reflection by interacting bodies. Human beings can't recognize infrared beams however transmits infrared from the body as warmth like all other warm blooded (creatures in which body temperature stays steady Mammals and Birds). This is used in Motion finders to identify the nearness of people. PIR sensors (Passive Infra-Red sensor) are utilized to actuate an alert framework utilizing the Infrared signals reflected by the body of the intruders in this particular case. PIR sensor is an electronic gadget that measures the infrared in its field of view. Development is identified by the sensor when an infrared source like human goes before the sensor with one temperature and contrasting another temperature like that of the divider in which the sensor is mounted. The PIR sensor is mounted on a PCB with different semiconductors. The total get together is mounted for a situation with a Fresnel focal point shaped before it. Behind the focal point, there is a little window through which infrared goes into the sensor. The window is secured with a straightforward plastic which permits just IR beams to go into the sensor and prevents visible light. The separating Window restrains the IR beams to 8-14 micrometers like the IR beams from human body. [3]



Fig. PIR motion detector sensor

Raspberry Pi Camera Module

The Raspberry Pi Camera is a custom designed add-on for Raspberry Pi. This camera attaches to Raspberry Pi by way of one of the two small sockets on the board upper surface. This interface uses the dedicated CSI (camera serial

interface) interface, which was designed especially for interfacing to cameras. The camera serial interface bus is capable of extremely high data rates, and it exclusively carries pixel data.



Fig. Raspberry Pi Camera Module

Buzzer/ Alarm

A buzzer or beeper is an audio signaling device, which may be electromechanical mechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include timers alarm devices, and confirmation of user input such as a mouse click or keystroke.

IV. RASPBERRY PI 3 MODEL

The size of raspberry pi is credit card size computer which is plug in computer monitor also used as a standard computer and mouse. It is very little device which is capable to use all ages of people to explore computing and also how to learn or executing programing language like scratched and python. The size of raspberry pi is credit card size computer which is plug in computer monitor also used as a standard computer and mouse. It is very little device which is capable to use all ages of people to explore computing and also how to learn or executing programming language like scratched and python. raspberry pi doesn't offer internal storage. This device is independent network connectivity. It was also access Via ASH or transfer file to it using FTP. It has been ready for public consumption at the year 2012 its make an idea of low cost educational microcomputer for student and children.

Pin Diagram of Raspberry Pi

Some of the pin on the GPIO have more than one purpose, depending on how they are programmed. The following diagram is a reference guide to all of the pin on the GPIO. The GPIO numbers on the yellow labels relate directly to those on the Broadcom chip, and are number generally used within scripts. The GPIO has 8 digital input/output pins available for use .

Pin#	NAME	Connection	Connection	NAME	Pin#
01	3.3V		5V (Powerboost)	5V	02
03	GPO 2		5V (Cupcade)	5V	04
05	GPO 3		GND (Powerboost)	Ground	06
07	GPO 4	START		GPO 14	08
09	Ground	GND (Cupcade)		GPO 16	10
11	GPO 17	UP		SELECT	GPO 18
13	GPO 27	DOWN		GND (Select/Start)	Ground
15	GPO 22	LEFT		RIGHT	GPO 23
17	3.3V		A	GPO 24	18
19	GPO 10	B		GND (ABXYR)	Ground
21	GPO 09	X		Y	GPO 25
23	GPO 11	L Shoulder		R Shoulder	GPO 08
25	Ground	GND (L)			GPO 07
27	ID_50			ID_SC	28
29	GPO 05			Ground	30
31	GPO 06			GPO 12	32
33	GPO 13			Ground	34
35	GPO 19			GPO 16	36
37	GPO 26			GPO 20	38
39	Ground			GPO 21	40

Fig. pin diagram of Raspberry Pi language

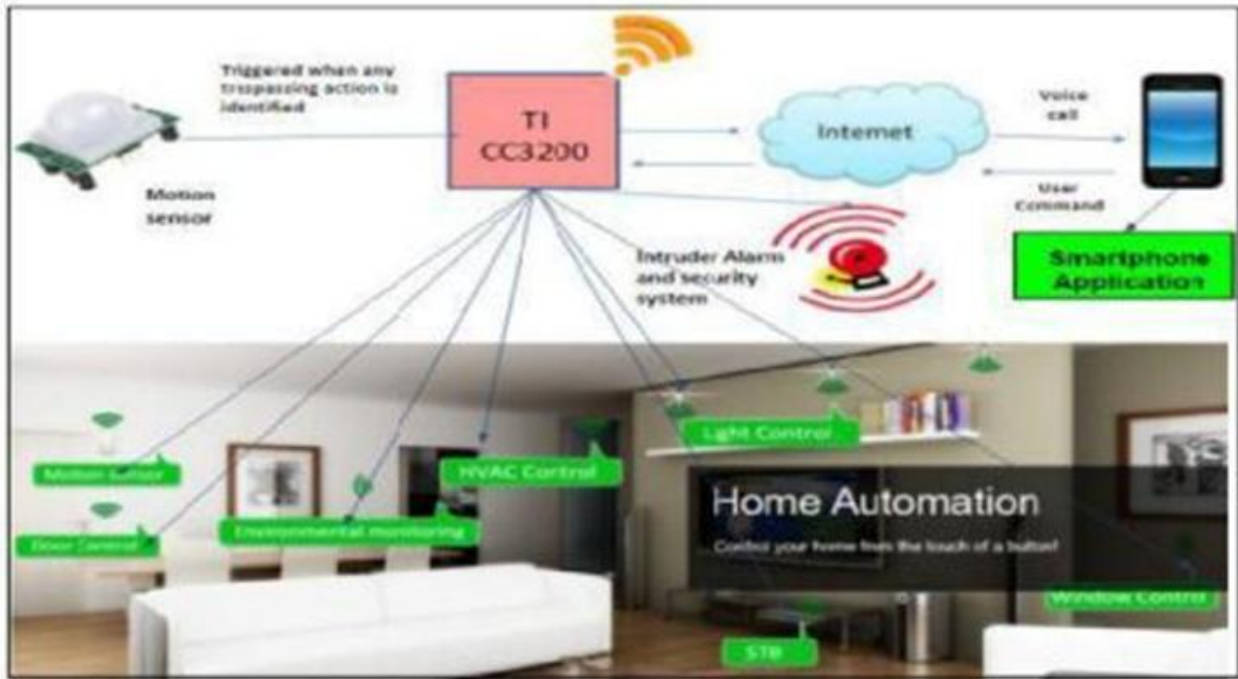


Fig. Home Automation and Security

This paper sheds the light on implementation of home automation and security system using raspberry pi kit, pi camera and different sensors like gas, ultrasonic, motion, etc. Home automation and security system shows that there are various kinds of technologies used to implement this type of system. All the proposed systems have been presented and compared in this paper which reveals some advantages and lacunas of the systems, the biggest lacuna is if internet get collapse the whole system get collapse. This review explained different home automation and security system e.g. Pi based, mobile-based, SMS based, raspberry microprocessor based, Android app based, IOT based and cloud-based. Due to its performance, simplicity, reliability and low cost home automation system is making its position in global market, that day is not so far when every home will be the smart home.

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