JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY

Department of Electronics and Communication Engineering

The Project Report is on

"Home Security System using Raspberry PI with IOT"

Submitted in partial fulfillment of the requirement for the degree of

Bachelor of Technology In Electronics and Communication Engineering

SUBMITTED BY:

DIVYA SINGH(20102019)

AYUSH GUPTA(20102018)

SUBMITTED TO:

MS. MONIKA

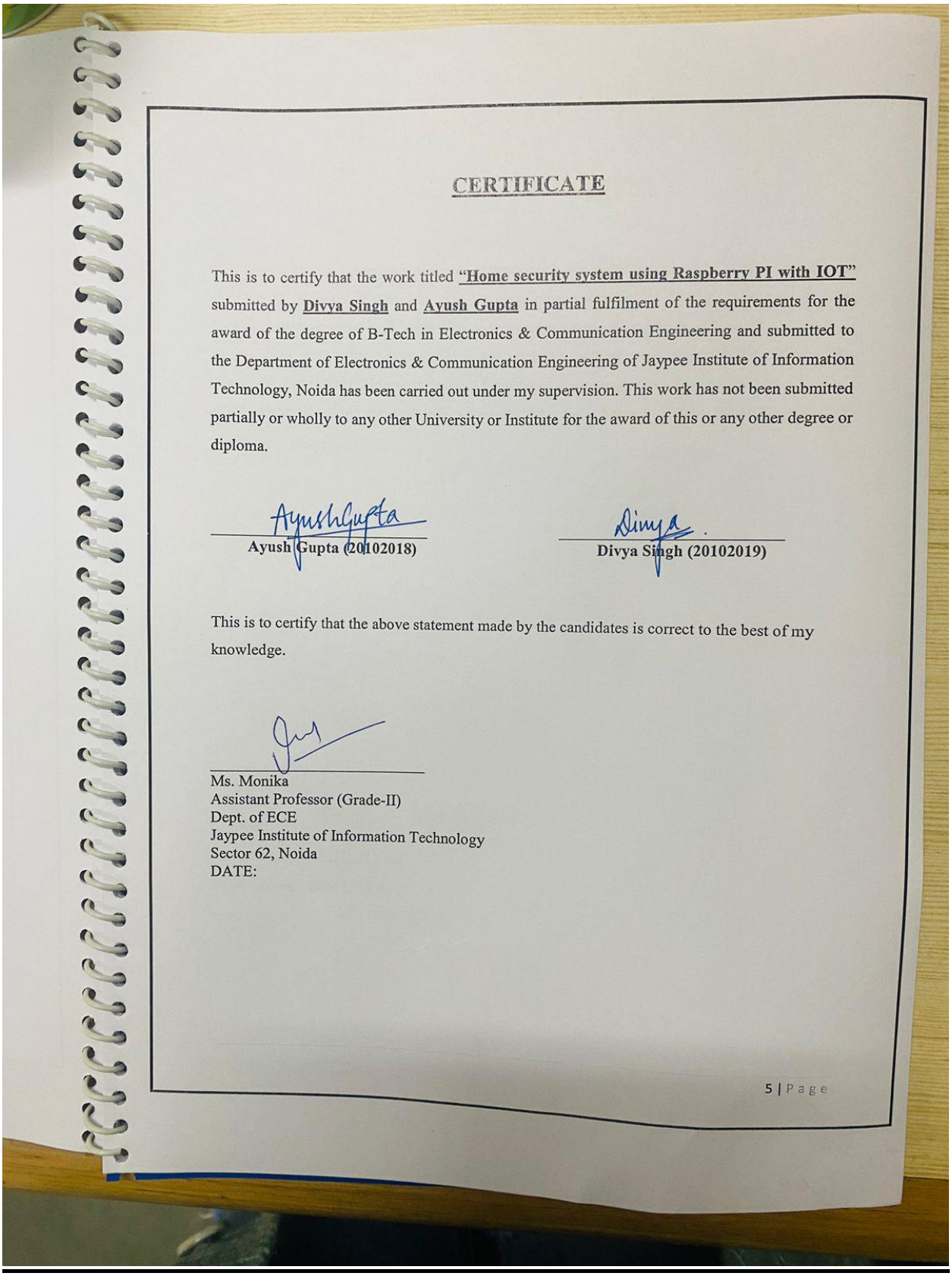
TABLE OF CONTENTS

Chapter No.	Topics	Page No
	Certificate from the Supervisor	5
	Acknowledgement	6
	Abstract	7
Chapter 1	Home security system using raspberry pi	
	1.1 Introduction	8
	1.2 Need for security system	9
	1.3 Scope of the project	11
	1.4 Impact of the project	12
	1.5 Proposed solution	13
	1.6 Project code	14
Chapter 2	Circuit design	
	2.1 Components and sensors used	20
	2.2 Circuit Diagram	21
	2.3 Working	22
	2.4 Components Used	23
Chapter 3	Applications	30
	3.1 Advantages	30
	3.2 Disadvantages	31

	Result	32
	Conclusion	36
	Future scope	37
	References	38

List of figures

Figure serial no.	Content Name	Page No.
Fig 2.1.1	Raspberry Pi	20
Fig 2.1.2	Arduino Uno	20
Fig 2.1.3	Circuit diagram of home security	21
Fig 2.1.4	Piezoelectric energy harvesting process	23
Fig 2.1.5	Piezoelectric sensor	24
Fig 2.1.6	Servo Motor	25
Fig 2.1.7	Camera Module	26
Fig 2.1.8	Raspberry Pi	27
Fig 2.1.9	Circuit diagram of raspberry pi	28
Fig 2.1.10	Raspbian	29
Fig 4.1.1	Work Output	32
Fig 4.1.2	Mail Received	33
Fig 4.1.3	Mail Content	34
Fig 4.1.4	Mail Content	35



CERTIFICATE

This is to certify that the work titled **"Home security system using Raspberry PI with IOT"** submitted by **Divya Singh** and **Ayush Gupta** in partial fulfilment of the requirements for the award of the degree of B-Tech in Electronics & Communication Engineering and submitted to the Department of Electronics & Communication Engineering of Jaypee Institute of Information Technology, Noida has been carried out under my supervision. This work has not been submitted partially or wholly to any other University or Institute for the award of this or any other degree or diploma.

Ayush Gupta (20102018)

Divya Singh (20102019)

This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Ms. Monika
Assistant Professor (Grade-II)
Dept. of ECE
Jaypee Institute of Information Technology
Sector 62, Noida
DATE:

5 | Page

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to our supervisor **Ms.Monika** for providing her invaluable guidance, comments, and suggestions throughout the course of the project. She consistently motivated and guided us towards the completion of the project. We our highly indebted to ma'am for her constant supervision as well as providing necessary information regarding the project. However, it would not have been possible without the kind support and encouragement of our parents and colleagues who have helped us out with their abilities in developing the project.

Signature ..... Divya. AyushGupta

Divya Singh 20102019 A1

Ayush Gupta 20102018 A1

Date .....8th Dec 2022.....

6 | Page

ABSTRACT

Westernization of today's society has led to the increase in the number of small families while the gradual spread of living into the suburban areas has raised a significant concern in the security of the individuals. Although there are many security systems available in the market today, they are mostly expensive. The objective of the model described in this paper is to present a simple and low-cost design to make our homes smarter and safer. The Raspberry pi based framework built in this project comprises of PIR sensor, IR sensor, Piezoelectric sensor and Sound sensor which not only alerts an intruder action but also captures the images and recordings through a camera from the scene. An intrusion can be identified with the help of the above mentioned sensors that can detect the presence of a person, temperature variations and sound at the location. In case of a deviant output from the above measurements, the owner of the house is immediately alerted through IoT. The rightful person receives a message on his phone immediately followed by images of the person causing the sceptical situation along with a captured video that gives a detailed picture of the happenings and will also serve as an evidence for further investigations.

CHAPTER 2

1.1 Introduction

To secure and guard our house in our absence, we propose the 10T based Anti-theft detection and alert System using Raspberry Pi. This system monitors the entire floor for movement. One single step anywhere on the floor is tracked and user is alarmed through mail over IOT. In this system, secure flooring tile connected with IOT, when the system is to be turned on, then whoever comes inside the house it passes the information over IOT. Whenever the thief enters in the house, and steps on the floor immediately it is sensed by the sensor which passes on the signal to raspberry pi controller. The controller in turn processes it to be valid signal and then moves the camera to the area where movement was detected and then transmits it over the Internet for the home owner to check the image.

1.2 NEED FOR SECURITY SYSTEM

Home security system is the most sort after mechanism to ensure the safety of valuables and to safeguard personal security as well. The development of burglar alert gadgets can limit the event of theft, while it can also identify and record suspicious trespassing. In places with high density like railroad stations and schools we can install face acknowledgment innovation which can identify hoodlums and suspicious people. Now-a-days, Security has become the most challenging task. Everyone wants safety but in present scenario, nothing is safe not even in their own houses. We generally lock houses when going out of the house. But just locking the home is not enough, there must be a system which safety our home, belongings and income from theft is the necessary requirements for home security system and keep track of the activities and report to the owner accordingly and works according to the response of the owner.

In places with high density like railroad stations and schools we can install face acknowledgment innovation which can identify hoodlums and suspicious people. This is a proactive technique that can control the event of the criminal occurrences and ensure the security of individuals and the property. To defeat the disadvantages of conventional burglar alarms, like infrared microwave indicators, glass break finder, microwave target movement locator, we propose the model presented int his paper. The infrared microwave finder is a crisis caution gadget dependent on the working standard of infrared and microwave. Compared with other conventional burglar alert products, infrared microwave indicators possibly create alert signs when it detects a difference between the microwave signals sent which have been split into two different and equal halves. If the difference is not zero, it indicates that there exist a movement. The glass break identifier is for

the most part used to identify the sound of glass breakage. The glass-pounding identifier has a restricted location run, it can just identify the recurrence sounds that originate from the wrecked glass and cannot be utilized for identifying normal glass vibration. The microwave target movement finder is a locator for recognizing the Doppler move of high recurrence radio waves and it is fundamentally utilized in open spaces. most commonly, square space. Compared to infrared wave indicator, microwave target movement identifier examines the comparative very high recurrence radio waves with extremely short frequencies, which implies that microwaves are easily reflected by other objects. The movement of reflected waves can be utilized to distinguish interruptions.

.

1.3 SCOPE OF THE PROJECT

THE SYSTEM CAN BE USED TO GUARD ROOMS, SECURITY VAULTS AT BANKS OR OTHER SECURITY SENSITIVE AREAS.

GLOBAL SCOPE OF PROJECT:

The widespread adoption of Internet of things (IOT) technologies has resulted in a smartly connected world to live in . It has gone into a brilliant time with a quickly developing innovation in the field of home security. The key idea of Internet of Things is to integrate each gadget/framework, for example, television, home appliances, advanced mobile phones and sensors associated with the Internet to be observed and controlled from anywhere . The primary targets of IoT are to manufacture exceptionally interconnected framework where gadgets will be the clients of the web . The Internet of Things (IoT) is a novel system administration worldview which permits the correspondence among a wide range of physical framework with the plenty of uses in the fields of agriculture, medicine, home security to name a few.

1.4 IMPACT OF IOT ON ANTI-THEFT TECHNOLOGY

The widespread adoption of Internet of things (IOT) technologies has resulted in a smartly connected world to live in. The key idea of Internet of Things is to integrate each gadget/framework, for example, television, home appliances, advanced mobile phones and sensors associated with the Internet to be observed and controlled from anywhere. The objective and scope of the design built in this paper is to develop an efficient and low-cost system that constantly screens the region where it is installed to recognize any suspicious activities or trespassers. IOT based system is superior to other methods that are used for home security purposes. IoT based system is quite costly and have a few disadvantages in effectiveness and availability to the client.

IoT based anti theft systems are implemented on vehicles successfully. So, we propose this system consisting of PIR, IR, Piezoelectric and Sound sensors. A camera and Raspberry pi circuit is employed with a USB drive to enable storage. When a movement is detected in the secured zone, the system with the assistance of a camera captures the pictures and video to recognize the zone of movement. The raspberry controller presently transmits the pictures and video over IOT to be seen by the client on the web. Likewise, it stores the information in USB for further reference. The client would now be able to interpret the information sent on the web through IoT to see the pictures of the incident remotely and the Raspberry Pi to start the signal alert.

1.5 PROPOSED SOLUTION

The primary point is to ensure the safety of our friends and family and our valuables at home. Today mumber of lot based home security systems are accessible in the market. Based on the literature survey and current market study, the technical advancements of IoT in the application of home security system have been a happening area of research. The primary concern is if the intruder posses quite some knowledge about a security system, the sensor can be de routed, hence employing additional sensors are required to record various other sensory captures. To monitor and safeguard our home in our absence we propose four sensors in the proposed system. Figure displays the overall architecture of the IoT based home security system. The system screens the whole floor for movement. This system is controlled by Raspberry pi incorporated with Piezo sensor, IR sensor. PIR sensor, Sound sensor, camera, Wi-Fi modem. At whatever point the intruder goes into the house, and steps in promptly it is detected by the sensor which gives the sign to raspberry pi controller. The controller transmits the captured image and video over the Internet for the client to check the recordings. Here we use IOT Cloud for the electronic GUI of IoT framework which sounds a muition and demonstrates the caught information to the client.

1.6 CODE OF THE PROJECT

```
import smtplib,email,os
from email.mime.base import MIMEBase
from email.mime.multipart import MIMEMultipart
from email.mime.text import MIMEText
from email import encoders
from picamera import PiCamera
import RPi.GPIO as GPIO
import datetime
from time import sleep
#************************************************ GPIO setup
************************************************
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)
GPIO.setup(17,GPIO.OUT)
servo1=GPIO.PWM(17,50)
piezor=20
piezol=16

GPIO.setup(piezor,GPIO.IN)
GPIO.setup(piezol,GPIO.IN)
```

```
#********************************************** Email parameters
**********************************************
subject='Security Alert'
bodyText1="Hi,\nA motion has been detected"
SMTP_SERVER='smtp.gmail.com'
SMTP_PORT=587
USERNAME='weirddoberman@gmail.com'
PASSWORD='czomcanbbkiqflqj'
RECIEVER_EMAIL='arushguptaga@gmail.com'
#********************************************** Video finename and
path **********************************************
filename_part1="security_system"
file_ext=".jpg"
now = datetime.datetime.now()
current_datetime = now.strftime("%d-%m-%Y_%H:%M:%S")
filename=filename_part1+"_"+current_datetime+file_ext
filepath="/home/pi/Pictures"

def send_email1():
    message=MIMEMultipart()
    message["From"]=USERNAME
    message["To"]=RECIEVER_EMAIL
    message["Subject"]=subject

    message.attach(MIMEText(bodyText1, 'plain'))
    attachment=open(filepath+filename, "rb")
```

```
    mimeBase=MIMEBase('application','octet-stream')
    mimeBase.set_payload((attachment).read())

    encoders.encode_base64(mimeBase)
    mimeBase.add_header('Content-Disposition', "attachment; filename=
" +filename)

    message.attach(mimeBase)
    text=message.as_string()

    session=smtplib.SMTP(SMTP_SERVER, SMTP_PORT)
    session.ehlo()
    session.starttls()
    session.ehlo()

    session.login(USERNAME, PASSWORD)
    session.sendmail(USERNAME, RECIEVER_EMAIL, text)
    session.quit
    print("Email sent")


def capture_video():
    camera.start_preview()
    camera.start_recording('/home/pi/Pictures/pic.jpg')
    camera.wait_recording(10)
    camera.stop_recording()
    camera.stop_preview()
```

```
def capture_pic():
    camera.start_preview()
    sleep(2)
    camera.capture('/home/pi/Pictures/pic.jpg')

def remove_file():
    if os.path.exists("/home/pi/Pictures/pic.jpg"):
        os.remove("/home/pi/Pictures/pic.jpg")
    else:
        print("file does not exist")
#********************************************************** Initiate pi
Camera
************************************************************************
*
camera=PiCamera()
#********************************************************** Main code for
method call
************************************************************************
*
while True:
    piezoinr=GPIO.input(piezor)
    piezoinl=GPIO.input(piezol)

    print("Piezo sensor left   ",piezoinr)

    print("Piezo sensor right    ",piezoinl)
    servo1.start(7)
```

```
print("Waiting 2 sec")
sleep(2)
if piezoinr==1:
    print("Motion Detected")
    servo1.ChangeDutyCycle(5)
    sleep(2)
    #capture_video()
    capture_pic()
    sleep(2)
    servo1.ChangeDutyCycle(7)
    sleep(0.5)
    servo1.ChangeDutyCycle(0)
    res=os.system("MP4Box -add /home/pi/Pictures/pic.jpg")
    os.system("mv /home/pi/Pictures/pic.jpg "+filepath+filename)

    send_email1()
    sleep(2)
    remove_file()
elif piezoinl==1:

    print("Motion Detected")
    servo1.ChangeDutyCycle(9)
    sleep(2)
    #capture_video()
    capture_pic()
    sleep(2)
    servo1.ChangeDutyCycle(7)
```

```
    sleep(0.5)
    servo1.ChangeDutyCycle(0)
    res=os.system("MP4Box -add /home/pi/Pictures/pic.jpg")
    os.system("mv /home/pi/Pictures/pic.jpg "+filepath+filename)

    send_email1()
    sleep(2)
    remove_file()
else:
    print("Safe Home")
```

CHAPTER 2

2.1 COMPONENTS AND SENSOR USED

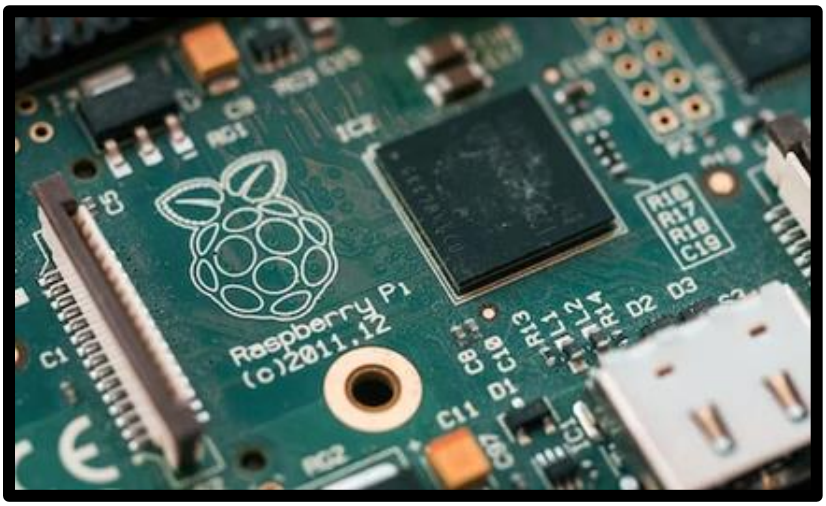


Fig2.1.1 RASPBERRY PI

Fig 2.1.2 ARDUINO UNO

2.2 CIRCUIT DIAGRAM

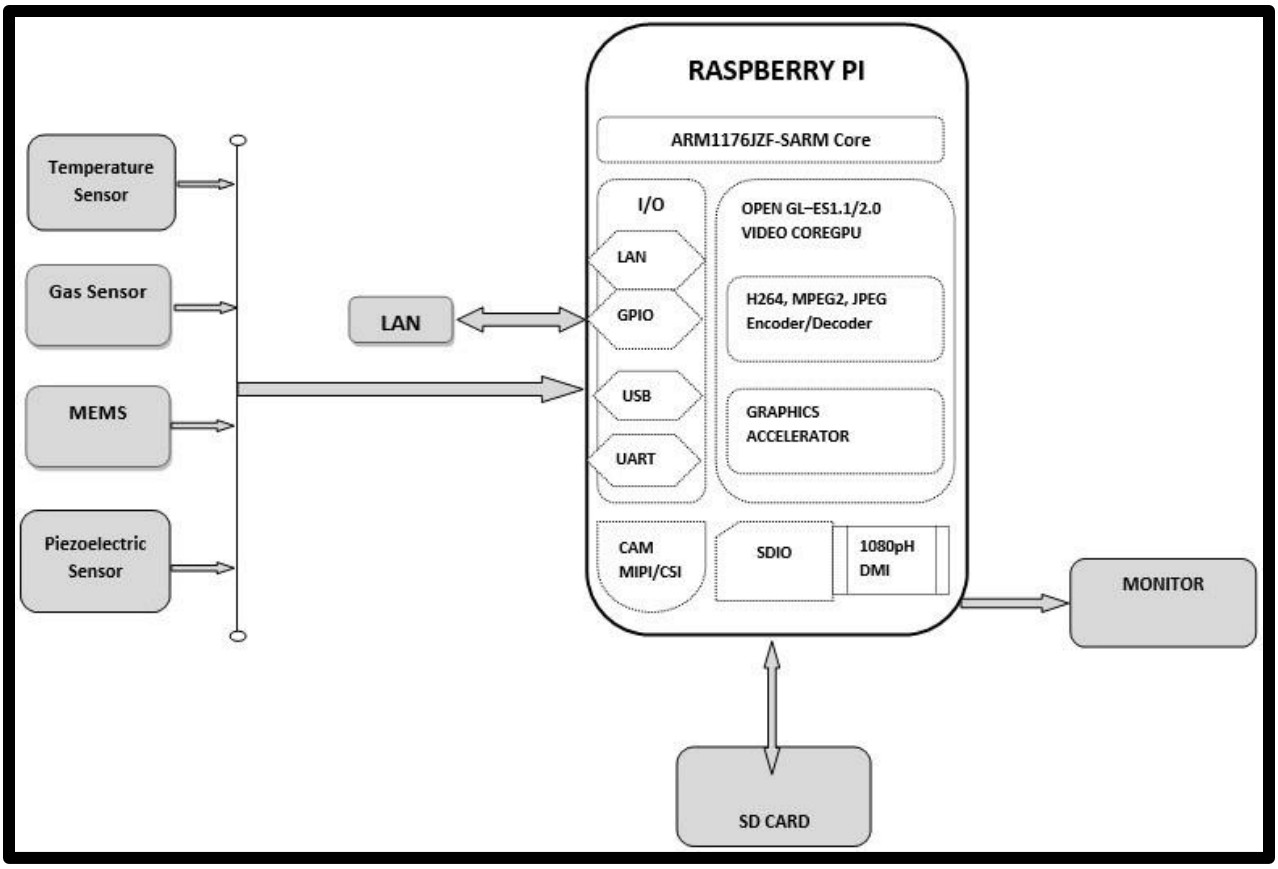


Fig 2.1.3

CIRCUIT DIAGRAM OF HOME SECURITY SYSTEM USING RASPBERRY PI

2.3 WORKING

To secure and guard our house in our absence, we propose the IOT based Anti-theft Flooring System using Raspberry Pi. This system monitors the entire floor for movement. One single step anywhere on the floor is tracked and user is alarmed over IOT. This system is secure flooring tile connected with IOT when we go out of house, the system is to be turned on, then whoever comes inside the house it passes the information over IOT. This system powered is by Raspberry pi it includes, two tiles for demonstration purpose, Piezo sensor, camera, wifi modem. Whenever the thief enters in the house, and steps on the floor immediately it is sensed by the sensor which passes on the signal to raspberry pi controller. The controller in turn processes it to be valid signal and then moves the camera to the area where movement was detected and then transmits it over the Internet for the home owner to check the image. The code uses SMTP protocol to transmit the picture of the intruder through internet. Apart from SMTP protocol an HTML server could be used to transfer the image or cloud servers could be used. In this project raspberry pi 3B+ (model) has been used as heart of system. This proposed system is an intelligent system and it eliminates the need of continuous by human resource. Thus, any human extra work is ruled out.

This system continuously checks the status of place by sensors that Is anyone entering in the shop or not. And sends the alert message to the owner with live images by rotating camera with different angles.

In this security system human bodies are detected by piezo sensor.

The main aim of this project is to make an automated security system for Banks and jewelry shops.

The project consists of Raspberry Pi with sensor and camera. The whole system is placed in that place. If system detect someone in Bank/shop it sets the capture the live images and sent it on e-mail.

2.4 COMPONENTS USED

1)PIEZOELECTRIC SENSOR

A piezoelectric sensor is a device that uses the piezoelectric effect to measure pressure, acceleration, strain or force by converting them to an electrical signal. Piezoelectric sensors have proven to be versatile tools for the measurement of various processes. They are used for quality assurance, process control and for research and development in many different industries it was only in the 1950s that the piezoelectric effect started to be used for industrial sensing applications. They have been successfully used in various applications, such as in medical, aerospace, nuclear instrumentation, and as a tilt sensor in consumer electronics or a pressure sensor in the touch pads of mobile phones. In the automotive industry, piezoelectric elements are used to monitor combustion when developing internal combustion engines. The sensors are either directly mounted into additional holes into the cylinder head or the spark/glow plug is equipped with a built-in miniature piezoelectric sensor. One disadvantage of piezoelectric sensors is that they cannot be used for truly static measurements. A static force results in a fixed amount of charge on the piezoelectric material. In conventional readout electronics, imperfect insulating materials and reduction in internal sensor resistance causes a constant loss of electrons and yields a decreasing signal. Elevated temperatures cause an additional drop in internal resistance and sensitivity.

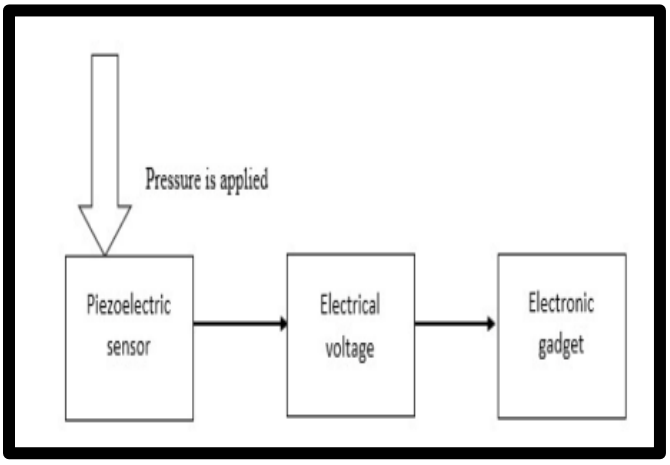


Fig 2.1.4 Piezoelectric energy harvesting process

Fig 2.1.5 Piezoelectric sensor

2)SERVO MOTOR

A **servomotor** (or **servo motor**) is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.Servomotors are not a specific class of motor, although the term *servomotor* is often used to refer to a motor suitable for use in a closed-loop control system.Servomotors are used in applications such as robotics, CNC machinery, and automated manufacturing. The motor is paired with some type of position encoder to provide position and speed feedback. In the simplest case, only the position is measured. The measured position of the output is compared to the command position, the external input to the controller. If the output position differs from that required, an error signal is generated which then causes the motor to rotate in either direction, as needed to bring the output shaft to the appropriate position. As the positions approach, the error signal reduces to zero and the motor stops.

The very simplest servomotors use position-only sensing via a potentiometer and bang-bang control of their motor; the motor always rotates at full speed (or is stopped). This type of servomotor is not widely used in industrial motion control, but it forms the basis of the simple and cheap servos used for radio-controlled models.

Fig 2.1.6 Servo Motor

3)CAMERA MODULE

The Raspberry Pi Camera Board is a custom designed add-on module for Raspberry Pi hardware. It attaches to Raspberry Pi hardware through a custom CSI interface. The sensor has 5 mega pixel native resolution in still capture mode. In video mode it supports capture resolutions up to 1080p at 30 frames per second. It is an image sensor integrated with a lens, control electronics, and an interface like CSI, Ethernet or plain raw low-voltage differential signaling. They are commonly used for surveillance, but, unlike analog closed-circuit television (CCTV) cameras, they require no local recording device, only a local area network. Most cameras are webcams, but the term *camera* or **netcam** usually applies only to those that can be directly accessed over a

network connection. One of the most popular abilities that consumer-level home security cameras have is to view their footage via a mobile app. Many cameras offer features such as a wide-angle lens, low-light or night vision capabilities, and motion detection. Most are developed to send out notifications via an application such as when motion is detected. Video clips can be stored in a local device such as a micro-SD Card or through a cloud service. Some camera manufacturers offer cloud subscriptions where users may remotely view and download recent video clips by paying recurring subscription fees. Cloud subscription plans typically come with several days of looping storage, and the videos will be overwritten beyond this duration.

Some cameras include a micro SD card slot so users can store videos locally. Most IP Cameras can be programmed to overwrite old video once the storage medium is full. Accessing the video on the camera can normally be done via a direct network connection to the device.

Fig 2.1.7 Camera Module

4) RASPBERRY PI

The Raspberry Pi 2: Model B+ is a miniature sized single-board computer with a fast 1.2 GHz 64-bit quad-core ARM Cortex-A53 processor. It can control input gadget and it can interface sensor to get sensor information. It has 40 GPIO pin (General Purpose Input Output) to interface sensors. Model B is the higher specific variation of the Raspberry Pi, with 512 MB of RAM, two USB ports, and a 100mb Ethernet port. It also has a slot for USB storage to save the proofs and

data. The processor collects the data from the PIR sensor, IR sensor, Piezoelectric sensor and the sound sensor. Figure 3 shows GPIO pins that connects the various sensors with the Raspberry Pi2 module. The Raspberry pi connected with all the sensors and as a prototype of the IoT based home security. The Broadcom BCM2835 SoC used in the first generation Raspberry Pi includes a 700 MHz 32-bit ARM1176JZF-S processor, Video Core IV graphics processing unit (GPU), and RAM. It has a level 1 (L1) cache of 16 KB and a level 2 (L2) cache of 128 KB. The level 2 cache is used primarily by the GPU. The SoC is stacked underneath the RAM chip, so only its edge is visible. The ARM1176JZ(F)-S is the same CPU used in the original iPhone, although at a higher clock rate, and mated with a much faster GPU.

The earlier V1.1 model of the Raspberry Pi 2 used a Broadcom BCM2836 SoC with a 900 MHz 32-bit, quad-core ARM Cortex-A7 processor, with 256 KB shared L2 cache. The Raspberry Pi 2 V1.2 was upgraded to a Broadcom BCM2837 SoC with a 1.2 GHz 64-bit quad-core ARM Cortex-A53 processor, the same one which is used on the Raspberry Pi 3, but underclocked (by default) to the same 900 MHz CPU clock speed as the V1.1. The BCM2836 SoC is no longer in production as of late 2016.

The Raspberry Pi 3 Model B uses a Broadcom BCM2837 SoC with a 1.2 GHz 64-bit quad-core ARM Cortex-A53 processor, with 512 KB shared L2 cache. The Model A+ and B+ are 1.4 GHz

The Raspberry Pi 4 uses a Broadcom BCM2711 SoC with a 1.5 GHz (later models: 1.8 GHz) 64-bit quad-core ARM Cortex-A72 processor, with 1 MB shared L2 cache.

Fig 2.1.8 Raspberry PI

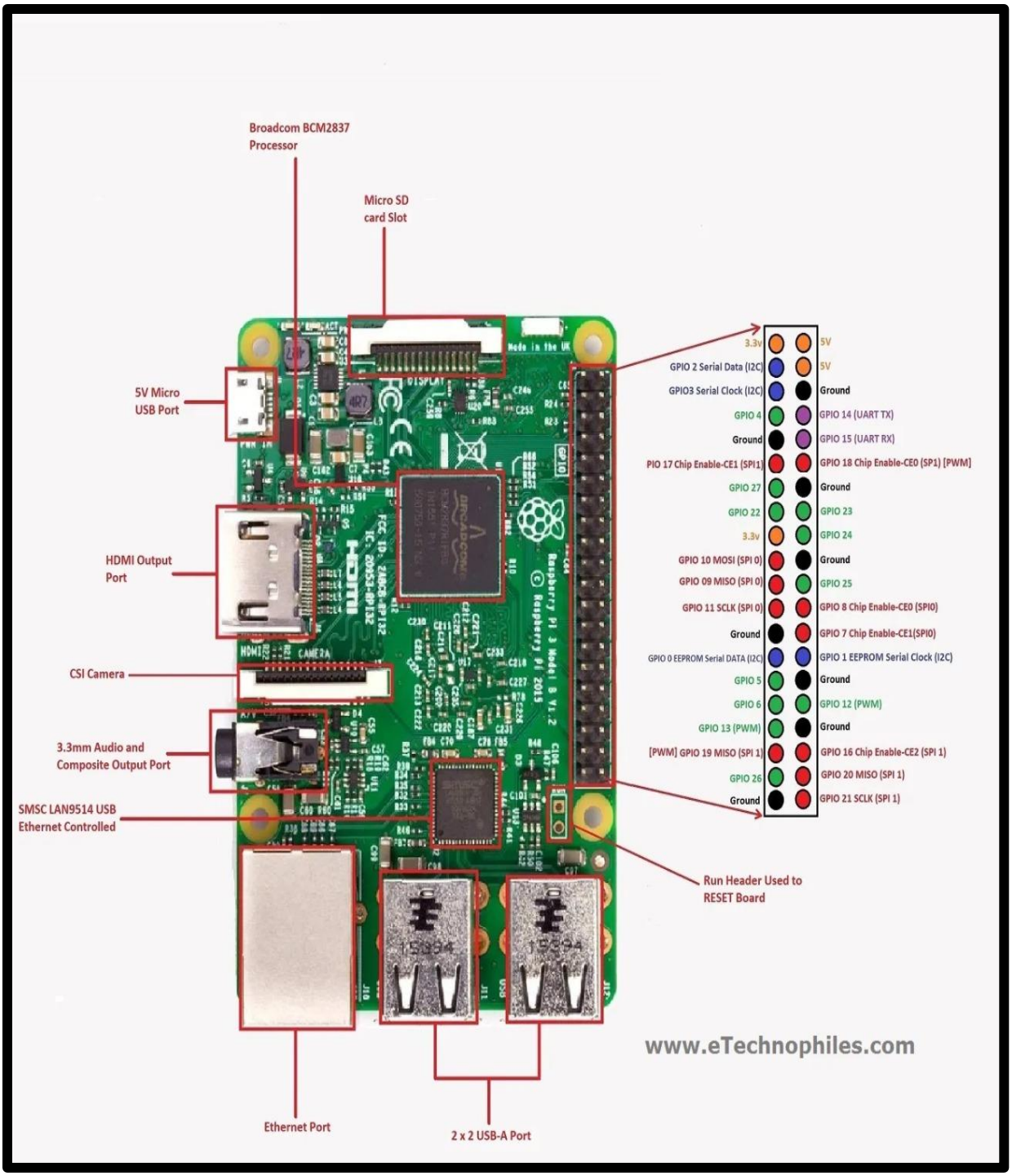


Fig 2.1.9 CIRCUIT DIAGRAM OF RASPBERRY PI

5)RASPBIAN OPERATING SYSTEM

Raspberry Pi OS (formerly **Raspbian**) is a Unix-like operating system based on the Debian Linux distribution for the Raspberry Pi family of compact single-board computers. First developed independently in 2012, it has been produced as the primary operating system for these boards since 2013, distributed by the Raspberry Pi Foundation.

Raspberry Pi OS is highly optimized for the Raspberry Pi with ARM CPUs. It runs on every Raspberry Pi except the Pico microcontroller. Raspberry Pi OS uses a modified LXDE desktop environment with the Open box stacking window manager, along with a unique theme. The default distribution is shipped with a copy of the computer algebra system Wolfram Mathematica, VLC, and a lightweight version of the Chromium web browser.

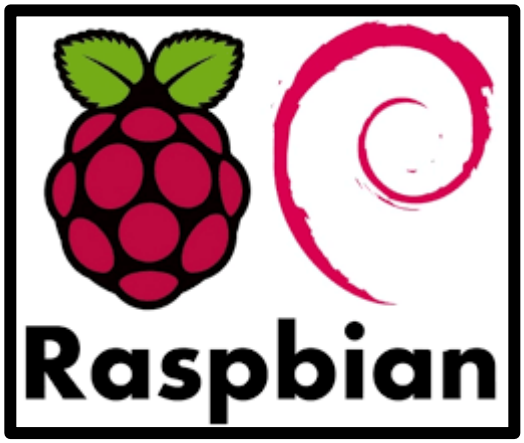


Fig 2.1.10 Raspbian

6)PYTHON 3 COMPILER

Complier used for coding the project of this home security system.

CHAPTER 3

3.1APPLICATIONS

➢ This home security system can be used in many areas like bank vaults and guard rooms.

➢ It is an advancement of the world min security system.

➢ Metros, Rural Applications etc.

➢ It can be used as a source for both A.0 and D.0 applications

➢ It is also used in universities

➢ It can be used in emergency power failure situations like hospitals.

3.2 ADVANTAGES

- The device was capable in distinguishing between human and animal intrusion using sensor for body temperature detection.
- It was using an alarm system which uses to alert the owner by making sound.
- It was convenient in use, relatively free from false alarms and does not require frequent user action to arm and disarm the system.

3.3 DISADVANTAGES

- The use of sensor for body temperature detection increases the cost of the project.
- The sound was made by device will not be recognized by the owner, if he/she is not present there.

CHAPTER 4

4.1 Work output

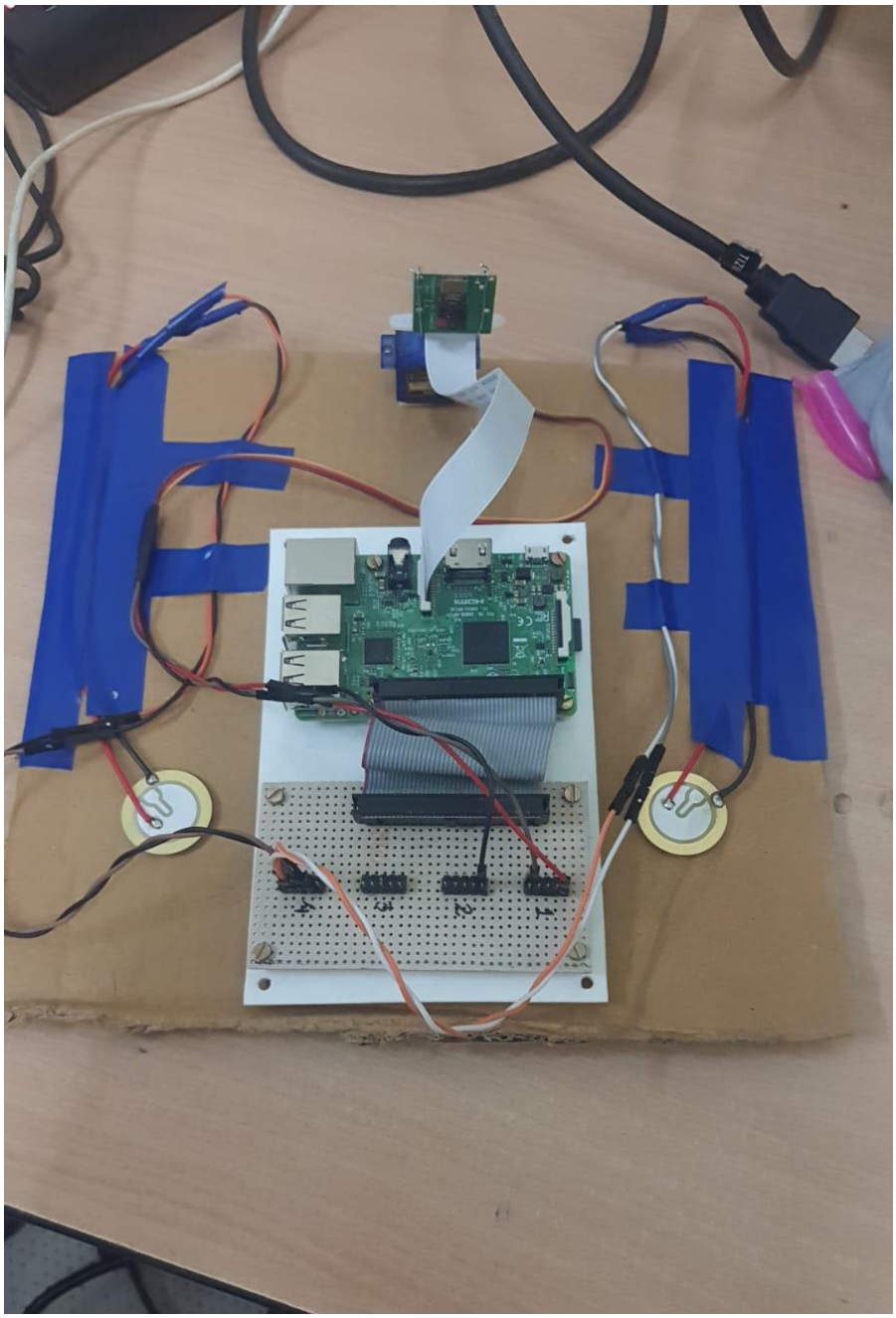


Fig 4.1.1 Work Output

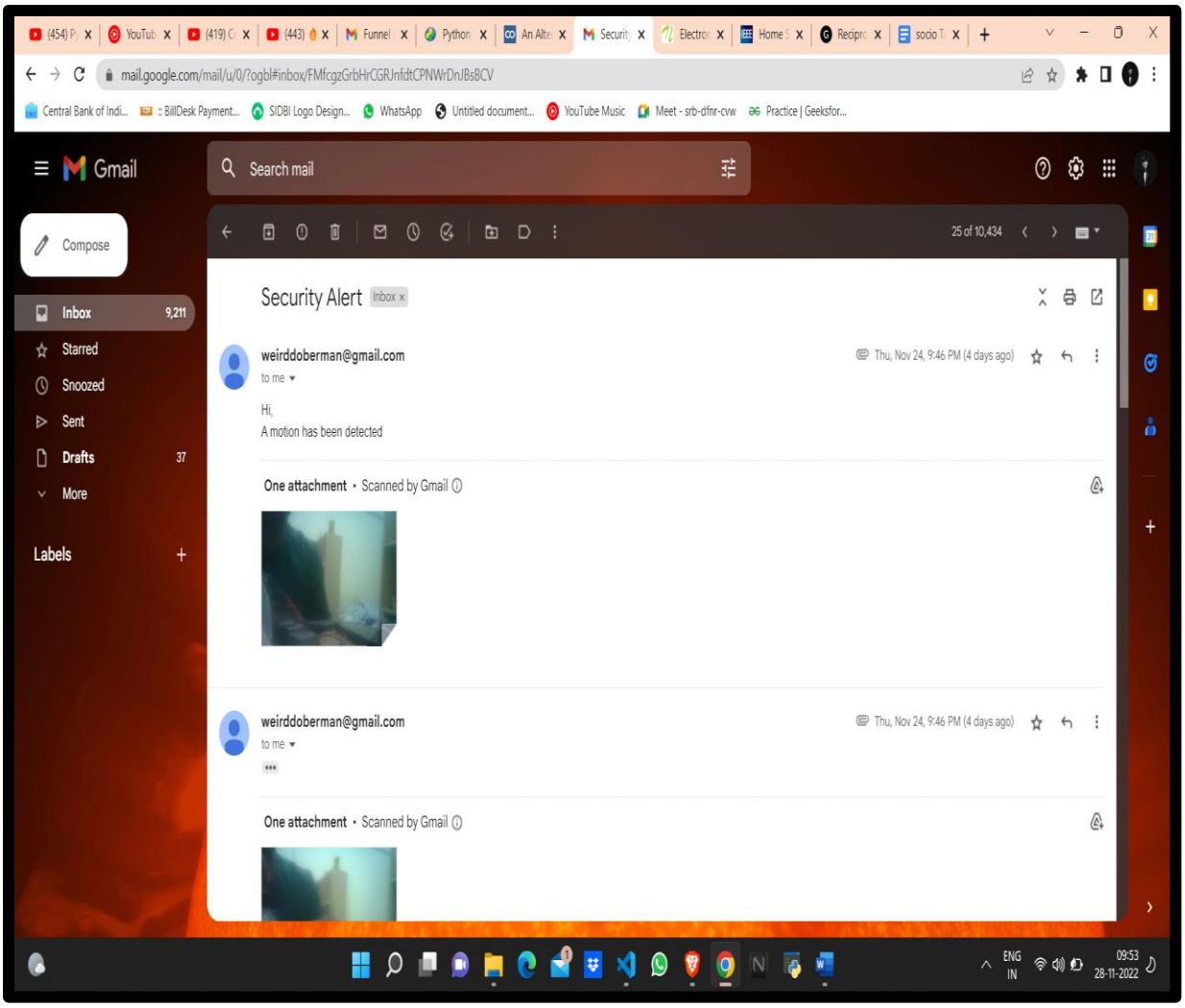


Fig 4.1.2 Mail Received

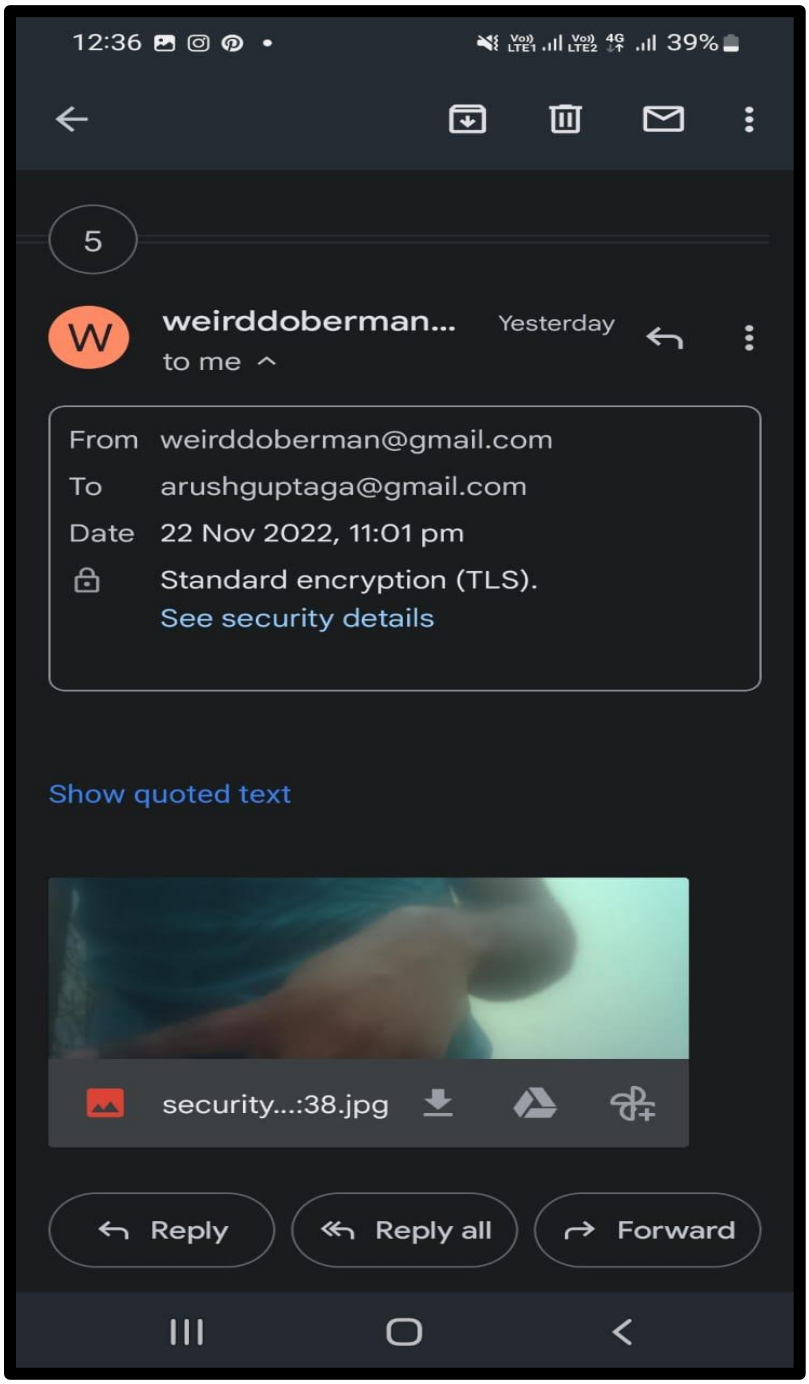


Fig 4.1.3 Mail Content

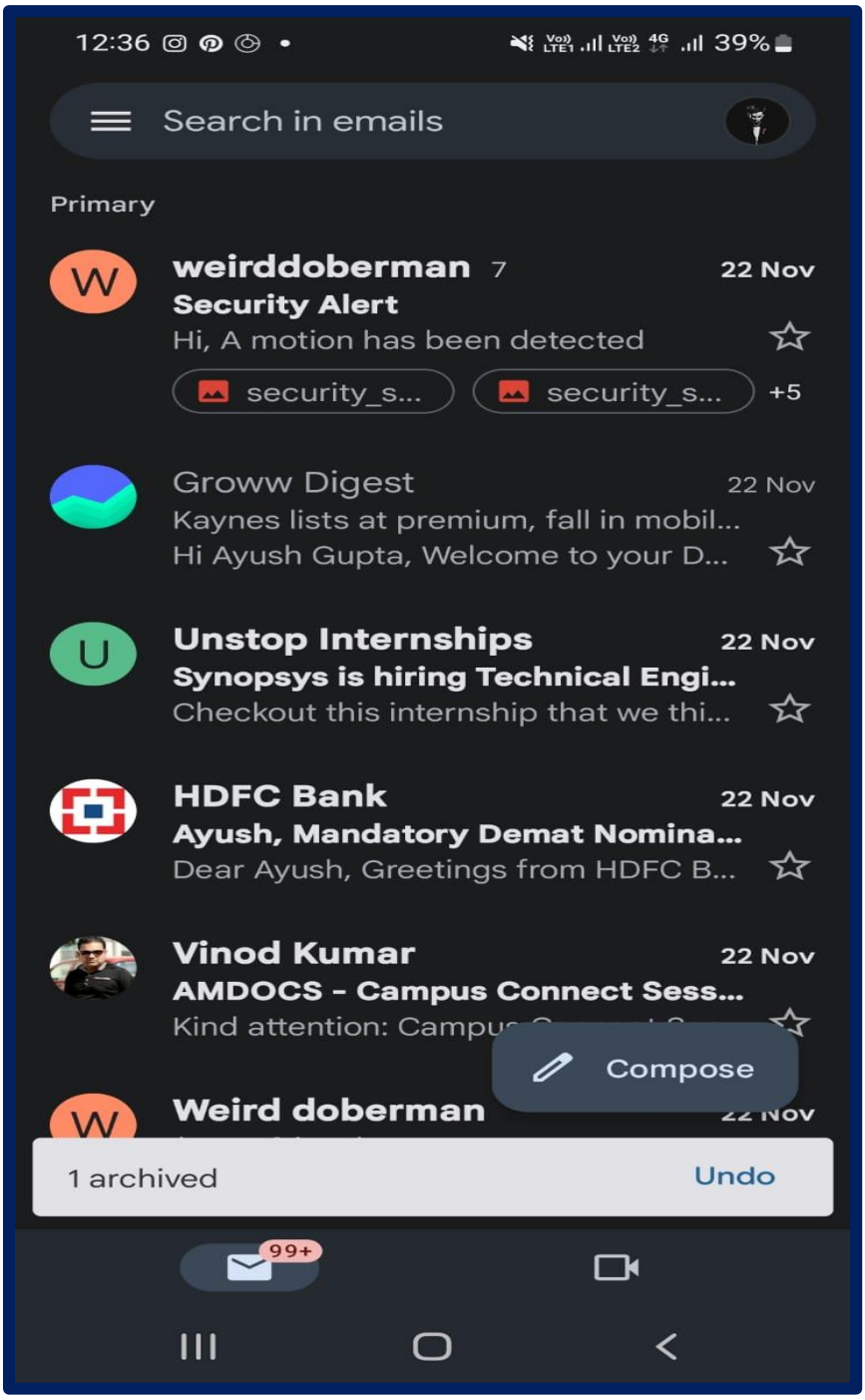


Fig 4.1.4 Mail Content

CONCLUSION

The project "IOT Based Raspberry Pi Home Security System Using Motion Detector" has demonstrated how to get a fully functional embedded product developed from scratch. This incorporated the cross aggregation and organization of fundamental libraries, the arrangement of implanted Linux and distributed computing innovation. This system is highly recommended to home territory observation for example individual office lodge, bank storage space, stopping passage. At whatever point the movement is distinguished through. The fundamental Advantage of the undertaking is Easy to actualize, Minimal effort with High quality.

The research work that will be carried out in this thesis would be mainly focused to design and develop efficient and convenient motion detection surveillance i.e. an Anti-Theft device to solve security problems which will help to reduce/stop theft. This system is suitable for small personal area surveillance. 1.e. personal office cabin, bank locker room, parking entrance. Whenever the motion is detected through. The main Advantage of the project is Easy to implement, Low cost with High quality.

FUTURE SCOPE

The project "IOT Based Raspberry Pi Home Security System Using Motion Detector" has demonstrated how to get a fully functional embedded product developed from scratch. This incorporated the cross aggregation and organization of fundamental libraries, the arrangement of implanted Linux and distributed computing innovation. This system is highly recommended to home territory observation for example individual office lodge, bank storage space, stopping passage. At whatever point the movement is distinguished through. The fundamental Advantage of the undertaking is Easy to actualize, Minimal effort with High quality.

From improvement point of view we can add new features to existing system such as delay alarm to the system so that owner can switch off the system if anyone enters by mistake into the secured zone and we can add a photo recognition technology and have some pictures of the authorized users if they unknowingly steps into the zone. This is proposed further to reduce the possibility of the unwanted or false burglary alarm which in turn reduces the sensitivity of the system.

REFERENCES

- S. Pirbhulal, H. Zhang, M. E. E Alahi, H. Ghayvat, S. C. Mukhopadhyay, Y. T. Zhang, et al., "A Novel Secure IoT-Based Smart Home Automation System Using a Wireless Sensor Network", Sensors (Basel Switzerland), vol. 17, no. 1, pp. 69, 2016, [online] Available: https://doi.org/10.3390/sl7010069.

- M. S. Uddin, M. M. Ahmed, J. B. Alam and M. Islam, "Smart anti-theft vehicle tracking system for Bangladesh based on Internet of Things", *2017 4th International Conference on Advances in Electrical Engineering (ICAEE)*, pp. 624-628, 2017, September.

- Ravi Kodali, Vishal Jain, Suvadeep Bose and Lakshmi Boppana, *IoT based smart security and home automation system.*, pp. 1286-1289, 2016

.

- Mohd Muntjir, Mohd Rahul and Hesham A. Alhumyani, "An Analysis of Internet of Things (IoT): Novel Architectures Modern Applications Security Aspects and Future Scope with Latest Case Studies", *INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT)*, vol. 06, no. 06, June 2017.

- Khanna and R. Tomar, "IoT based interactive shopping ecosystem", *2016 2nd International Conference on Next Generation Computing Technologies (NGCT)*, pp. 40-45, 2016.

- D. Kamal Surya Teja, Ch. Rupa, Ch. Roop Kumar, K. Pavan, "Secure Smart Room with Intelligent Power Management", *2022 International Conference on Electronics and Renewable Systems (ICEARS)*, pp.923-928, 2022.

- Sajid Nazir, Yovin Poorun, Mohammad Kaleem, "Person Detection with Deep Learning and IoT for Smart Home Security on Amazon Cloud", *2021 International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME)*, pp.1-6, 2021.