Under graduate

Raspberry pi based Project

Motion Tracker for Elderly Assisted Living Home

Under Guidance of:

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CONTENTS

1. INTRODUCTION

A study done by American Association of Retired Persons has also shown that nearly 90% of people over the age of 65 years prefer to stay at home and they need day-to-day assistance or health care facility. In fact, living at home and staying in a familiar community may offer benefits to seniors' emotional well-being. However due to the modern culture and busy urban lifestyle, most seniors who should be receiving assisted living care are either living alone all the time, or when their loved ones are away to work. Although this problem can be easily solved by making a move to nursing home where social activity, health monitoring and medication management are well taken care of; it is costly for most people and difficult to adjust when the elderly refuses to stay away from home. Leaving elderly at home alone may also cause anxiety for the caretakers who are at their workplace far away. In order to lessen the worries of the caretaker, a smart assisted living eco-system need to be in placed to enable the elderly to seek help in the case of emergency. In this work, we developed an elderly friendly system platform, which is capable of tracking motion of the elderly within an indoor home environment [4].

2. OBJECTIVE

The objective of this project is to help the people who are working or away from their elderly parents and want their parents to be safe and within their reach with the help of modern technology. This would help them to alert or protect their elderly parents from any threat and medical condition. This project will help them by sending an email alert when the motion of their parent occurs or if someone their parent home [4].

3. COMPONENTS

1. Raspberry pi 3
2. Raspberry pi 3 camera (5 Mega Pixel).
3. Data card [1]
4. Adapter (power supply).
5. PIR (passive infrared) sensor [7]

4. CIRCUIT DIAGRAM

The circuit connection is shown in Fig. 1 which has simple and easy to install PIR sensor. The PIR sensor contains three pins mainly: power, signal, and ground.

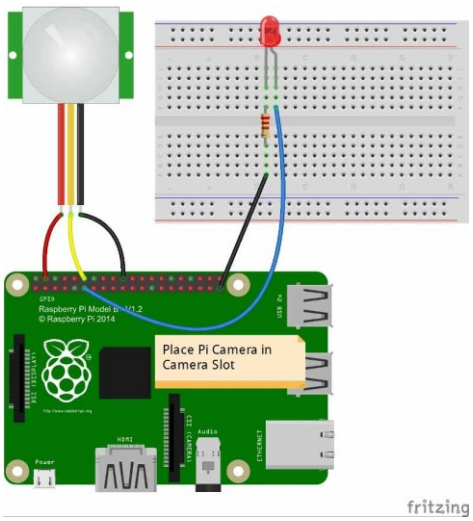

Figure 1: Overall circuit diagram [5]

The power pin has to connect to Raspberry pi GPIO pin no 4, and signal pin has to connect to GPIO pin no 12 and ground pin has to connect to GPIO pin no 20. A LED also connect to GPIO pin no 11 to check the output of the PIR sensor along with a resistor for limiting the current [5], [8].

5. SOFTWARE AND HARDWARE

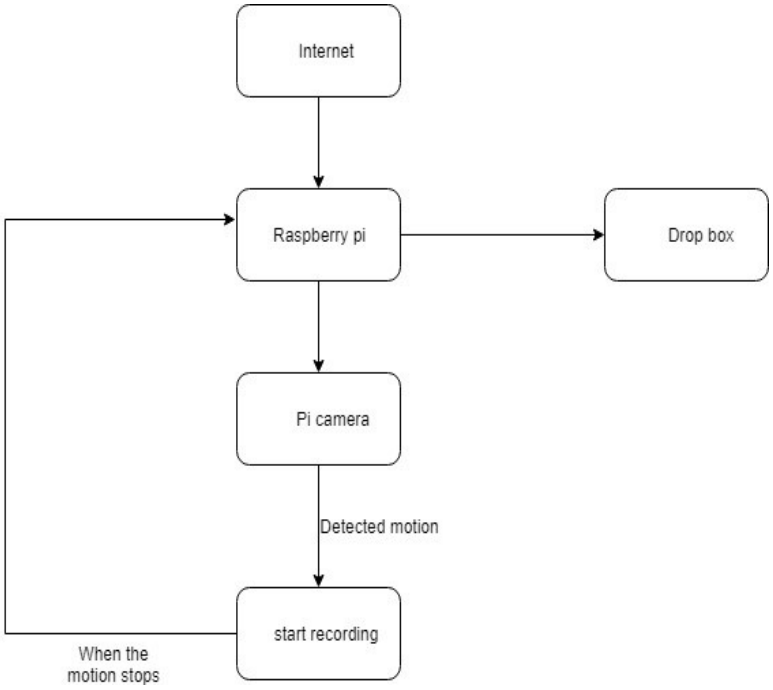

Figure 2: Flow chart/block diagram that describe the entire process of the project

Raspberry pi:

Raspberry pi play an important role in making this project. Also, many software projects uses Raspberry pi as main component because it has same feature like a computers. It has built in

Wifi support, Audio jack, Camera port, LED screen display port, HDMI port, Bluetooth, Ethernet connection, and GPIO (general input and output pins). It has QUAD Core Broadcom BCM2837 64-bit ARMv7 processor, with Linux based operating system support. It has all the powerful features that can meet many requirement of a project[9].

Pi Camera:

Camera is used to record the video when the movement is detected. This camera works only with the Raspberry pi. There are different types of camera's available in the market but in this work Raspberry pi camera model B featuring a fixed lens is used. It's capable of 3280 × 2464 pixel static images, The camera should be carefully used because the static electricity interface could cause damage.[10]

PIR sensor:

PIR sensor also play important role in this project. This sensor only dectect the animals and human beings because the name itself says passive infrared means it is passive in nature with infrared radiations. Then how it detects humans humans means generally humans releases heat in the form of radiations, it has two knobs at its back to increase or decrese the sensitivity of the sensor.[7]

Data Card:

Raspberry requires internet connection to send email alert to the user. The data card is used to give the internet connection. And in new versions of raspberry pi we have in bulit wifi support but when if need to use this project as portable and need to change the location of the set up to another place we need to use data card.[1]

6. CONSTRUCTION

The main components included in this project are pi-camera, PIR sensor and LED. PIR sensor has 3 pins: power, signal, and ground. These pins need to be connected to GPIO pins no: 4, 12, 20, respectively. An LED is connected to check the working of PIR sensor.

7. WORKING

Working of this Project is very simple. A PIR sensor is used to detect the presence of any person and a Pi Camera is used to capture the images when the presence it detected.

Whenever anyone or intruder comes in range of PIR sensor, PIR Sensor triggers the Pi Camera through Raspberry Pi. Raspberry pi sends commands to Pi camera to click the picture and save it. After it, Raspberry Pi creates a mail and sends it to the defined mail address with recently clicked images. The mail contains a message and picture of intruder as attachment. Here we have used the message “Please find the attachment”, you can change it accordingly in the Code given at the end.[5]

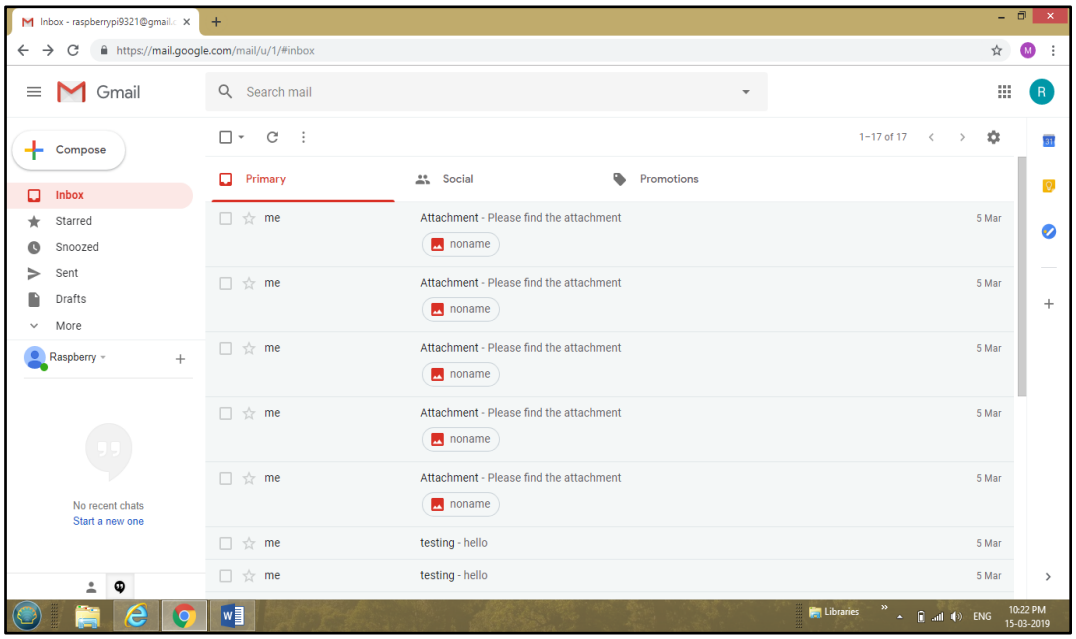

Figure 3: Email alert system

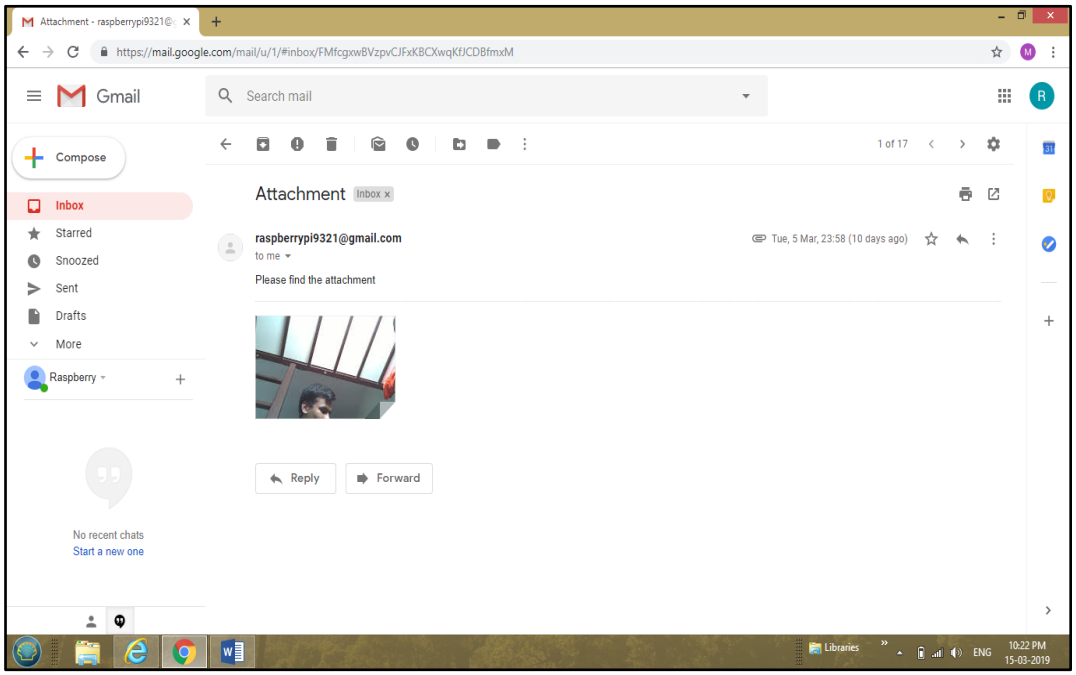

Figure 4: A sent email when motion is detected.

Figure 5: Photo taken when the motion was detected

8. WORK PLAN

Delivery										
Testing										
Integration with IDE										
Coding Raspberry pi										
Hardware analysis										
Components identified										
Literature survey										
Days to task	Jan. 1-31	Feb. 1-7	Feb. 8-16	Feb. 17 - 25	Feb 25- 29	Mar1-8	Mar 9-16	Mar 16-23	Mar 23- 30	Apr 1 -4

References

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