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REAL TIME MONITORING OF WOMAN SAFETY WITH LOCATION TRACKING SYSTEM

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Abstract

According to the organizations like NCRB-social government and the reports of WHO, 35% women are subjected to physical harassment, abuse and violence that occur even in public places such as cabs, hospitals, public transport, public parks, in and around schools, railway-bus stands, foot paths, and worse in the very own neighbors. Changing dynamics of working environment also forces many to work in night shifts which make them to move out in vulnerable timings. In India, according to amendment to the Factories Act 1948, it was allowed under the law for women to work night shifts which enabled many women to work through shifts but also put them in risk. Most of the women are working in nightshiftsimply there is an increase in their productivity, quality and international competitiveness because of which many women tend to work nowadays and support their families. Companies always provide necessary security measures in place to ensure women safety, yet in several situations incidents happened to prove the vulnerability of them due to several attributes. Research works were being undertaken to device strategies, protocols, policies to protect women workforce from being vulnerable.

In this paper an attempt is made to make a device for the women security where the device provides the safety measure in public places, public transports such as cabs, schools, buses and company vehicle etc. We propose an advanced model, which aims to provide a safe environment for women in the society through live video streaming by embedding sensors with a processor chip. The core of the entire system is

raspberry pi, Pi Camera which is used for video data which will be collected by the embedded system and sent to the cloud by wireless network. Through this device a live video camera is implemented in the device which feds the live video through a GPS module that can be used to trace the whereabouts and the issues a woman may face which can be used to rescue under distress situation.

Keywords : Raspberry Pi, Embedded System, Pi camera, Image Capture, Video Streaming.

I. Introduction

In recent times, women are participating in the process of economic development on an equal footing with men [I], as earlier they used to stay at home to do their domestic duties. Studies shown in [XI, X] have demonstrated that in overall worldwide women are experiencing many of forms of violence throughout their life by their relatives, neighbors and by men who feel like power and authority example boss, police. However this development never came without consequences, they face certain issues including harassment and other forms of violence against women either in work place or while travelling. Violence against women takes someforms likechild abuse, sexual harassment, acid throwing, marital rape, beating and neglect of older women, some of them take place in work place, and some in other areas but in every aspect women become vulnerable [IX]. Globally the victims are women who are involved in a range of physical, emotional acts of control, threat and assault.

Women are participating in most the spheres of economic activity, be it an organization, institution or any a factory they work together for the development. With their vigorous efforts and selfless service there is an increase in the number of working women and national wide entrepreneurs.All organizations support promotes focus in building women entrepreneurs and upgrade in self-employment among women. Various schemes are being organized for women to start their ventures. An amendment in the factories act has been approved in India [I], allowing women to work in night shifts. The different working zones are textiles, handicrafts, IT sectors, and garments.

I.i. Issues Women Facing in Outside World:

In the public sector like media, sports, work area, or in the home, women are facing difficult situations. Women in all areas of the landscape can see in diverse and conflicting ways as either too liberated or not liberated enough. Globally for women in all societies, street harassment in public is a significant and prevalent problem.

I.i.a. Impact of Harassment

Women experiencing violence has consequences that will vary depending on the individuality, and the severity of the harassment. This will lead the way of a woman as temporary or prolonged stress and depression [V, VI, XVIII, and XV]. The physical symptoms reported can be guilty, fear, headaches, nausea, and gastro intestinal disorders. Similarly, the list of mental health symptoms suggests difficulties associated with stress, sleeplessness, nightmares, panic, fatigue or loss of motivation, feeling betrayed, feeling angry or violent, loss of confidence and self-esteem [IX].

I.ii. Need for Protection

In India women are given equal rights as men, still they are in fear as people do not follow this rule. If we take a look behind the curtains, we see they are being exploited though they are in respected positions in the country. Today, for the women safety security is the most important factor. For women security, there is a need for developing a portable device [IV].

II. Methodology

Figure1 shows the block diagram of the proposed system. It consists of GPS module, Raspberry Pi, Pi camera. The Pi board is used for video processing and sending the data to the authentic person over the internet. With the help of processor we will make all the data compatible to send over the wireless medium that is the internet. Serial communication is used for communication between the Raspberry Pi (ARM11 Processor) and GPS module [XVI]. The GPS module is used to know the exact location of the women [III]. The webpage is accessed by calling the IP address of the Raspberry Pi processor [II]. The authentic person can only access the data only, because we provide the security through the username and password to access the webpage. HTML webpage can open at any device which is having the internet connection to it.

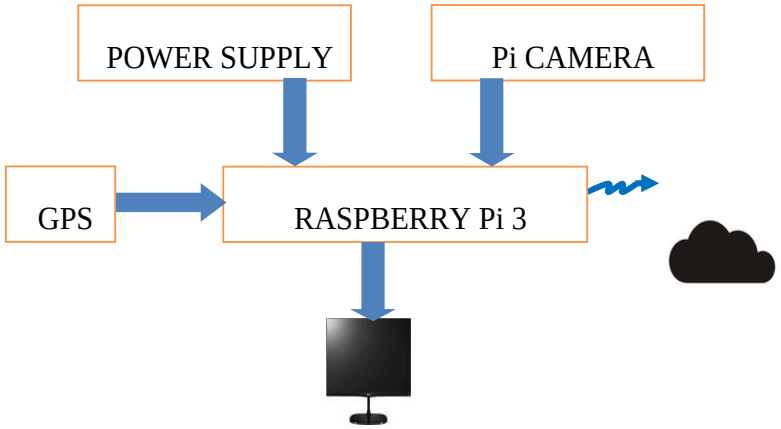

Fig. 1: Block Diagram of the proposed system.

A. Raspberry PI 3

The Raspberry Pi is a single-board computer, designed to easily interact with its environment. The basic functions of this are similar to desktop PC which are provides games, play HD video, word processing etc.people of all ages can explore computing and learn how to program in various languages, such as Python, Scratch [VII].

The proposed model uses Raspberry Pi 3.Compared to the first generation of raspberry Pi, it brings an extra powerful processor, improves in its speed by a factor

of ten. Since it has Bluetooth connectivity, it makes ultimate solution for powerful connected designs. Its features include 1 HDMI Port, Micro SD card slot,1 micro USB slot, 1.2 GHZ Quad Core ARM V8 Processor, Wi-Fi and Bluetooth, 4 USB Ports, Ethernet Port, 1 DSI,1 CSI, 1GB of RAM, Video core 4 model GPU,3.5mm audio jack [XII, XIV, XVII]. It runs through Linux operating systems, and nearlyall the programs are Linux compatible. For security purposes raspberry Pi makes a vital role and remarkably affordable cost. The raspberry Pi 3 model is shown in figure 2.

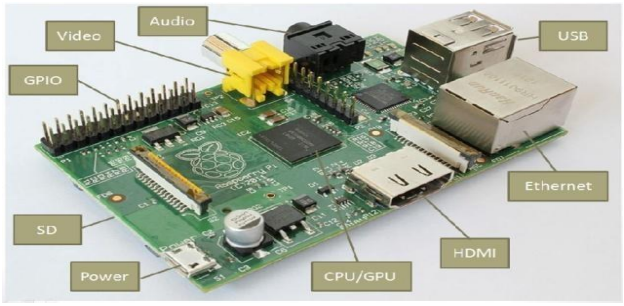

Fig. 2: Raspberry pi-3

B. GPS Receiver

The principle of Global positioning system lies in how to calculate the position of the user on the earth. GPS satellites transmit signals to GPS receiver (user) on earth surface to find out the position of the user, time and their velocity. The location which is recorded is stored in tracking unit or can be transmitted to database, or internet connected system using a GPRS [VIII]. Later, by using software the tracked location can be displayed. GPS navigation has wide range of applications as they can be employed on the ground, on the sea, in the air and in space [XIII].

C. Pi Camera

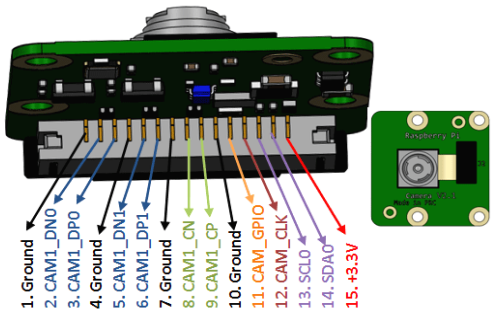

Fig. 3: Pi Camera

Raspberry Pisupports Pi Camera module which is a portable light weight camera as shown in figure 3. ThisPi Camera works with all available models of raspberry Pi.

Behind the Ethernet port there is a CSI port where Pi camera is connected. The Pi Camera gives better results in lightening conditions. We need to use raspistill and raspivid utilities to capture images and videos. In terms of frame rate and resolution, Pi camera provides better performance compared to a webcam. Pi camera module can be directly used in python program to work on images and videos. Since it is directly interfaced to the raspberry Pi and does not use USB port, it cannot be used with any other computer.

III. Results

By installing the proposed system in the required location, power should be switched on by the concerned women as shown in figure 4. As power is on, the raspberry pi will boot which takes a while. Once the booting is done, run the program file. IP address is generated by configuring the WI-FI. This IP address can be sent to the emergency contacts of victim as shown in figure 5 and 6. Using Pi camera we can capture video and can save the video for the recording purpose and can capture the image of the attacker.This recording will be saved on to the hard drive connected to the system and can be on the computer as shown in figure 7. Finally, we can trace victim location through GPS and the victim is saved.

Fig. 4: Experimental setup

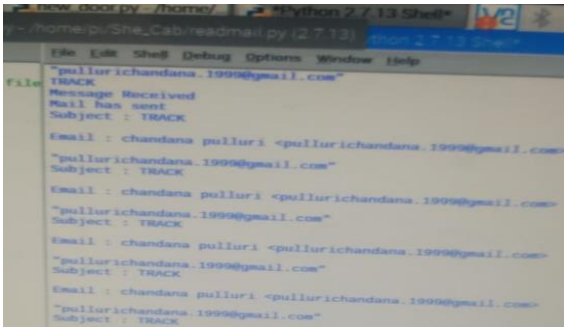

Fig. 5: After receiving mail by parent

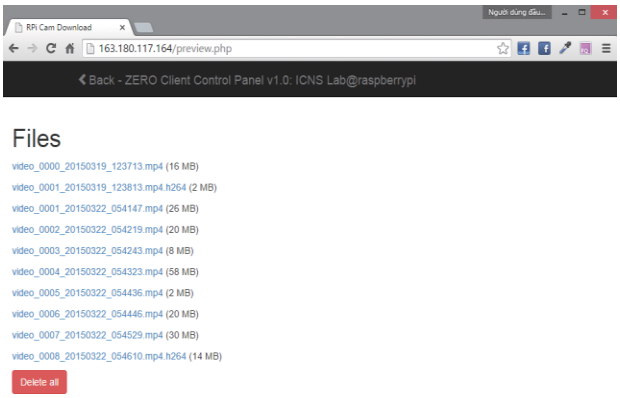

Fig. 6: List of videos streaming

Fig. 7: Real time preview video

IV. Conclusion

Thus, we have designed a smart, compact, cost effective system capable of capturing video and transmit over the internet. It is most important to have the reliability of privacy and security on both ends, which is achieved in this project. It is provided authentication at the receiver side; hence it can access by the concern person only. The proposed system uses the Raspberry Pi-3, and Picamera as primary components in system execution. By a micro-USB cable the battery is connected to Raspberry Pi. Raspberry Piuses the programming language known as python, which is a High-Level Object-Oriented programming. In Parallel, the location of a woman is tracked through a GPS receiver. Tracking of a location will alert the emergency contacts and help can be received easily by the victim. The emergency contact persons open the IP address to view the live video, so that it is helpful to get right justice for the victim. Hence the proposed device is beneficial to supportwomen in society to work till late nights, provides a safe environment, and equality in gender.

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