Raspberry Pi Based Safety System for Women and Children

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Abstract— In today's world, a security bear becomes a big concern for female, children and even elders. Women are getting assaulted, children are getting kidnapped, elder citizens are also facing many problems like a robbery, etc. The working women feeling unsafe because of larger crimes and also missing child cases are increasing rapidly all over the world. Child care is major issue in solving this epidemic. The best solution for this problem is safety. So we design safety system for women & child security using Raspberry Pi. Raspberry Pi is interfaced with camera, GPS, GSM and Panic Button. This device is activated by the click of a button by the women/children that will fetch current location of the women/children and also capture the image of the attacker via Raspberry Pi camera. Link of the captured image and location will be sent to predefined mails through IOT. Alternatively GSM sends alerts SMS to family and friends.

Keywords- Raspberry pi 3 model B+, camera, GPS, GSM, Panic Button and Safe Button.

1. INTRODUCTION

In Today's World Women Safety is the most Important Issue In very Country. Women are at risk of violence both in public and private spheres, in and around the home, in neighborhoods and at city level. Availability of data on violence against women and girls has increased significantly in recent years. In the present situation, women are competing with men in each prospect of society. Both men and women have equal rights, responsibilities and work load. Women and girls still feel unsafe to travel alone whether it is a day or night because women are been attacked by men irrespective of their ages. The fear of harassment against women is not only the condition at outside but it may also happen at homes. Harassment cases are increasing day by day.

There are also several unsolved cases are reported especially on missing children. Most of the time children being lost in the public places, like the malls, markets, and etc. Many kidnapping cases result in child raping and murdering. Therefore this paper proposes women/child safety system. It consists of Pushbutton, when it is pressed, the device will get activated automatically within a fraction of seconds. Immediately camera will capture the image/video of the attacker, GPS will track the location of the women and transmit it to the mail through IOT and also the captured video/image is stored in pen drive for the purpose of evidence and identification. Alternatively GSM send alert message to the family and friends.

2. EXISTING SYSTEM

A. VITHU APP

Fig 1: vithu app

VithU App as the name suggests it is always with you. VithU App is available in both Android and IOS platforms. This app is very simple to use. As you open this app a message pops up 'A valid Internet connection is needed to access all Local services'. After that you need select desired contacts that you want to send alert message.

By default the app has 2 contacts to select and can be increased by clicking on 'Add to contacts'. After selecting contacts then click on 'Activate'. By pressing power button 2 times a message will be send. The message would be 'I am in danger. I need help. Please follow my location'. The message will allow the receivers to find out the last location of the victim.
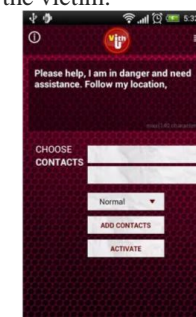

Fig 2: Setup page

B. Disha SOS

The State government developed the Disha App, which sends an alert to the police control room when a woman or a girl in distress shakes the smartphone with the app three times. The App also has a single touch SOS button that would alert the police control room in case of distress and ensure speedy response.

This app also sends an alert to family members and police in case a woman or a girl is in distress. This option contains five contact

numbers of family and friends to send alert message. It also contains another option called 'Track My Travel' for safety and guidance during travel.
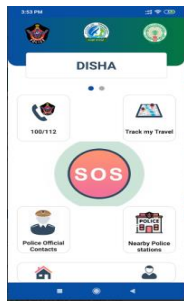

Fig 3: Disha SoS App

Dial 100 and Dial 112 numbers are also available in the mobile phone app. This app also contains special option to find out the details of police officials' contact and nearest police station. Information on hospitals, maternity centers, trauma care centers, blood banks and pharmacies will be made available in the app. It contains push button option at Command control centre in Police Headquarters and an alert can be sent to police and users of the app at the same time.

C. Bluetooth gps application based on latitude and longitude for child tracking model

This paper presented by Norsuzila Ya'acob, Siti Sarah Saaiddutdin, Azita Laily Yusof and Nani Fadzlina Naim. This system consists of a bluetooth GPS receiver and an android Smartphone. Communication between GPS and a Smartphone is via Bluetooth protocol which requires the Bluetooth GPS to be paired with smartphone. To activate the child tracking app parents need to insert their child's detail such as name, age, colour, height and weight. A picture of children is also required. To use the tracking device, parent's phone must be paired with the GPS device. If the parent's phone is not connected to Bluetooth GPS device, the background screen is in white colour. If both devices are successfully connected, then background screen colour will be turn into red. as shown in Figure-4.

Fig 4: Child data profile and picture

When child away from parents more than 10meter then an alert shall be triggered and sent to user's phone as a warning to indicate that the children are away from the parents. Then, the SHARE button is enabled at the same time. If the SHARE button is pressed, the list of media social list shall appear and users can select through which app they would like to share the alert message which is shown in Figure-5.

Fig 5: List of App available will appear for selection

For example, if the users select Whatsapp as their option, then the alert message will be sent to Whatsapp recipients containing the children profile as shown in Figure-6. If users want to know the location of their children, they needed to press TRACE YOUR BABY button to see the location, which is based on latitude and longitude.

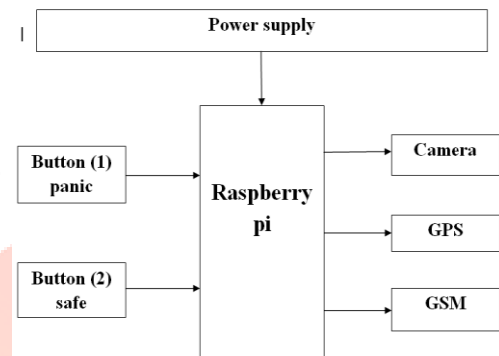Fig 6: Information sent through wattsapp.

3. PROPOSED SYSTEM

Fig 7: Block Diagram of Women Safety System

The main aim of this paper is women/child safety and security using raspberry pi. The raspberry pi is integrated with a camera, GPS, GSM and Push Button. When woman/children are in danger they need press panic button that will trigger raspberry pi. Automatically camera will start to capture the video and GPS will track the location. SMS alert with location and captured image/video will send to the concerned authorities. If women/child became safe that time they need press safe button that will send safe message to the concerned authorities.
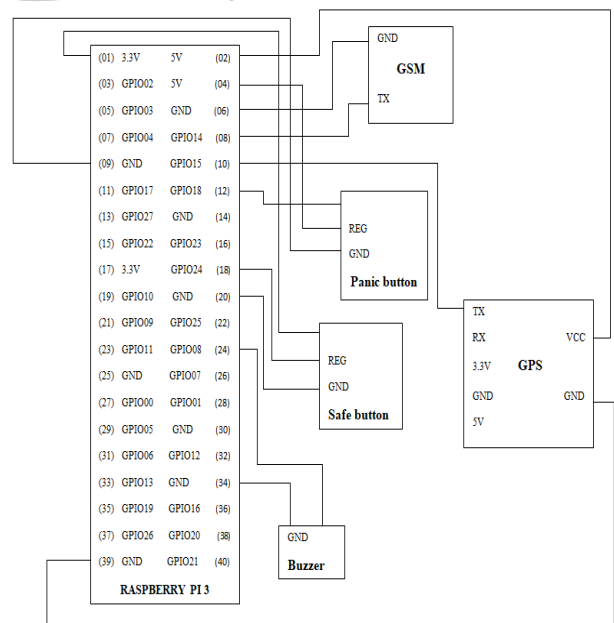
4. CIRCUIT DIAGRAM AND ITS COMPONENTS

Fig 8: Circuit Diagram of Proposed Method

Proposed system consists of raspberry pi 3 B+, panic button, safe button, buzzer, GSM and GPS. Raspberry pi 3 model B has 40 pins. Raspberry pi 9th, GPIO18 pins are connected to panic button and 4th pin is connected to resistor in panic button. Raspberry pi

1st, 20th pins are connected to safe button and GPIO24 pin is connected to resistor in safe button. Raspberry pi GPIO08 and 34th pins are connected to buzzer. Raspberry pi 6th and GPIO14 pins are connected to GSM. GPS has 5 pins namely TX, RX, 3.3V, GND and 5V. TX is connected to GPIO15 of Raspberry pi. GPS also has VCC and GND. VCC is connected to 2nd pin of Raspberry pi. GND is connected to 39th pin of Raspberry pi.

Raspberry pi

The Raspberry Pi is a little, modest, small PC on a solitary circuit board, and has been structured so that it expends less force than the normal PC. The raspberry pi comprises of the small-scale USB power, show port, miniaturized scale SD opening, HDMI, port, sound video jack, CPU, GPIO pins. Raspberry pi board contains Quad Core 1.4GHz Broadcom BCM2837B0 ARMv8 64bit CPU, 1GB RAM, 2.4GHz and 5GHz IEEE802.11.b/g/n/ac wireless LAN, Ethernet port, 40-pin extended GPIO, 4 USB 2 ports, 4 Pole 3.5 mm jack with audio output and composite video output, Full size HDMI, CSI camera port for connecting a Raspberry Pi camera, DSI display port for connecting a Raspberry Pi touch screen display, Micro SD port, 5v/2.5A DC power input.

Pi Camera

This Raspberry Pi Camera Module is a custom designed add-on for Raspberry Pi. It attaches to Raspberry Pi by way of one of the two small sockets on the board upper surface. This interface uses the dedicated CSI interface; therefore it is designed especially for interfacing to cameras. The CSI bus is capable of extremely high data rates, and it exclusively carries pixel data.

- No adapters required. This camera will plug directly into the Raspberry Pi 3 Model B camera port.
- Resolution: 5 MP
- Interface Type: CSI(Camera Serial Interface)
- Dimensions: 25x23x8 (LxWxH) mm
- Supported Video Formats: 1080p @ 30fps, 720p @ 60fps and 640x480p 60/90 video
- Fully Compatible with Raspberry Pi 3 model B.

GPS

This GPS receiver utilizes the S1216 Skytraq, It supports NMEA 0183 V3.01 standard, and has integrated interfaces to facilitate the requirements of different communication methods like RS232 and TTL. This package also includes a 1.5ft external magnetic GPS antenna.

GSM

GSM/GPRS Modem-RS232 is built with Dual Band GSM/GPRS engine- SIM900A, works on frequencies 900/ 1800 MHz. The Modem is coming with RS232 interface, which allows you connect PC as well as microcontroller with RS232 Chip (MAX232). The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as DATA transfer application in M2M interface.

Push button

A push button switch is a small, sealed mechanism that completes an electric circuit when you press on it. When it's on, a small metal spring inside makes contact with two wires, allowing electricity to flow. When it's off, the spring retracts, contact is interrupted, and current won't flow.
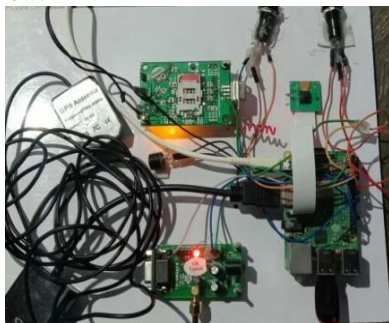

Fig 9: Safety model system

5. RESULTS

The raspberry pi is integrated with GPS, GSM, camera and Push button. GPS will track the location of the victim in latitude and longitude. Figure 8 shows the current location of the victim.
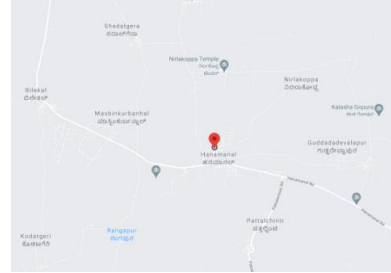

Figure 10: The location of the victim

Camera will capture the video/image. Figure 9 shows the captured image of the victim.

Fig 11: Captured Image of a Victim

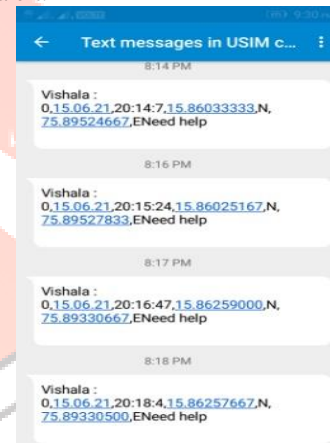GSM will send SMS alert to selected contact number. Figure 10 shows the SMS alert.

Fig 12: SMS alert

When women/child became safe they will press button (2) that will send SMS alert to selected contact number as I am safe. Figure 11 shows the SMS as I'm safe.
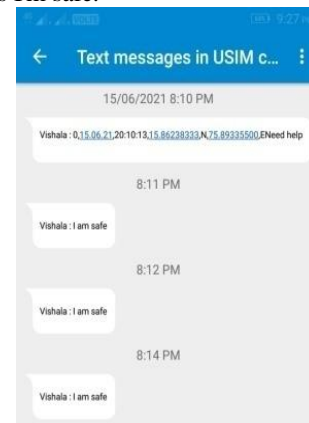

Figure 13: SMS alert as I m Safe

6. CONCLUSION

This paper proposed a model for the child and women security in public places which aims to provide the safety environment. This device is extremely portable and can be activated by the victim just by the click of a button that will fetch her current location and also capture the image of the attacker via Raspberry Pi camera. The location and the link of the image captured will be sent to predefined mails through IOT. Alternatively GSM will send SMS to predefined number. This system is able to protect women/child safety by monitoring the location of the women/child.

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