Smart Shield for Women Safety

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Abstract – *Nowadays, there are news of women harassment than their achievements. Women feel unsafe to travel alone at odd hours. There are many android applications that are developed for women safety. But it is not always possible to carry our mobile phones wherever we go or sometimes we forget to carry it. The proposed system is an attempt made to solve the problems of women safety.*

The scope of the system is to develop a smart device which can help women in some emergency situations. The system is a smart wearable device which resembles a jacket. The device contains different modules such as GPS (Global Positioning System), GSM (Global System for Mobile communication), Camera, Buzzer, Shock Mechanism Circuit. The main objective of the system is to provide a reliable security system for a women when they are alone or feel unsafe.

Key Words: Wearable device, GPS, GSM, Buzzer, Sensors, Raspberry Pi

1.INTRODUCTION

In today's date, women face physical harassment in public places, schools and at workplaces or while traveling. Most cases of physical harassment take place when women are alone or while traveling. Women feel insecure to step outside their house.

There are many android applications for smartphones but for those who don't use smartphones or those who cannot keep their mobile handy at their workplace, this proposed system will be helpful.

The system suggests a smart wearable device for security which contains different modules such as GSM, GPS, Camera, Buzzer, Shock Mechanism Circuit, micro-controller, and sensors. The proposed system helps women in emergency situation by activating the modules on clicking the switch and provide emergency self-defence.

1.1 Problem Statement

At any emergency situation people get panicked and in that situation, they may not be able to operate their smartphone applications, and cannot immediately defend the attacker and protect themselves. The proposed system can be useful for women and children for security purpose. It consists of a wearable safety device having sensors and an emergency button which when activated sends an alert message with location information to the victim's family and nearby police station.

1.2 Literature Survey

The literature survey of some existing systems is done:

[1] Women safety device and application. In this paper an ARM controller and Android application are used in which both the device and the smartphone are synchronized using Bluetooth, hence both can be triggered independently. It can record audio for further investigation and can give an alert call and message to the pre-set contacts with the instant location every 2 minutes and can be tracked live using the application. Hidden camera detector is also a distinct feature used which ensures privacy.

[2] A mobile-based women safety application (I safe Apps). In this paper, mobile-based application (I safe apps) is developed with the Android support to know whether a woman is safe. It gives the location of the woman in danger by giving fake phone calls, video forwarding, location and first-aid information.

[3] Advanced Security system for women. The paper proposes an automated highly reliable women security device which consists of advanced sensors embedded in a wearable dress. It consists of advanced sensors and ATMEGA8 micro controller with Arduino tool which keep user under observation at all the time. It monitors the heartbeat rate, temperature and vibration in the body through sensors to check for uneasy situations.

[4] Woman safety, the system has different sensors like heartbeat sensor, temperature sensor, accelerometer sensor for detecting the heartbeat, temperature and sudden change in motion of the user. GPS and GSM which will help to detect the location of the device and to send an alert message to guardians, relatives and police station.

2. Methodology

A number of sensors can be used in this system such as detecting the heartbeat of a person via health monitoring sensor and temperature sensor. The GPS and GSM are

integrated with the device used to send an alert notification to the emergency contacts.

- *Pulse rate sensor:*

Pulse rate sensor is used to detect the pulse rate of a person. It activates the system when the normal pulse rate increased beyond the fixed threshold value i.e. greater than 100 beats per minute.

- *Temperature sensor:*

It plays a vital role in human health condition. The normal temperature of human body is 25 to 45 degrees Celsius. If it goes beyond 45 degree Celsius. then the sensor activates this system.

- *GPS/GSM Module:*

  ◦ GPS is used to track the live location of the user. The location is traced from the satellites orbiting the earth. The location is retrieved in the form of latitude and longitude coordinates.
  ◦ GSM is used to send data from source to destination according to the input signals from the sensor.

- *Buzzer Module:*

When the module activates, it continuously gives out siren which helps to grab the attention of the nearby public.

- *Camera:*

When the device is activated the camera starts capturing the images continuously. Which will be useful for the police to find the culprit.

- *Shock Circuit:*

The shock circuit generates an electric jolt which can be used as a self-defense mechanism.

- *Fall Detector:*

The Fall Detector has the following features:

  ◦ Automatic fall detection
  ◦ Integrated vibration pre-alarm

2.1 Block Diagram

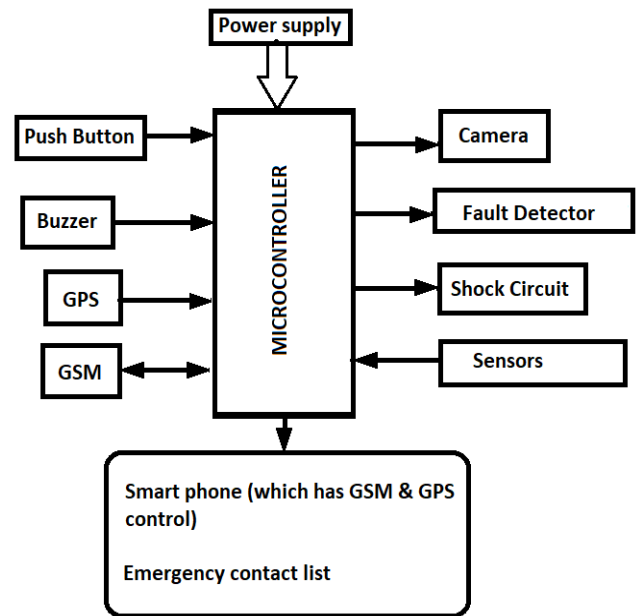The block diagram of the conceptual system is shown in below figure.

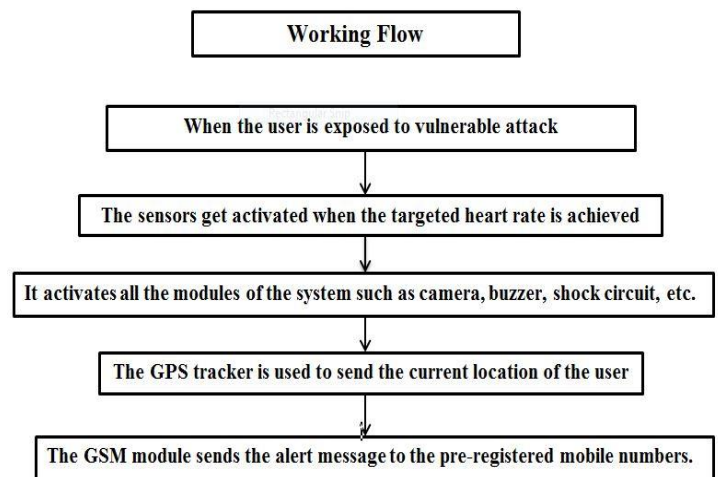Figure 2.1 System Block Diagram

2.2 Flow Chart

Figure 2.2 Flow Chart

2.3 Working

The device can be activated in three ways:

1. Manual Switch(Button)

2. Auto Mode(Using sensors)

3. By Falling(Fall Detector)

When it gets activated an alert message is generated along with the current location of the victim, with the help of GPS module. This message is forwarded to the victims family and the closest police station using the GSM module. At the same

time the camera starts capturing the images and audio is also recorded, this will be helpful as the proofs and help the police to find the culprits. The buzzer produces an extremely annoying and loud sound which will grab the attention of nearby people and distract the attacker. An immediate defense is provided by the Shock Circuit System which will generate an electric jolt.

3. Advantages

- Compact in size.
- Wireless connectivity.
- Easy and fast to install.
- Easy Maintenance
- Low cost with high performance.
- Works round the clock.
- Fast response.
- Environmental friendly system.
- Easy to carry

4. Applications

- Provide parents with a sense of security for their child in today's time.
- Can be used for the safety of physically challenged & elderly aged people.
- Used for tracking soldiers.
- Ensures women's safety.
- Can be used for tracking pets or wild animals.
- Live location tracking. Can be used as a legal evidence of crime with exact location information for prosecution.
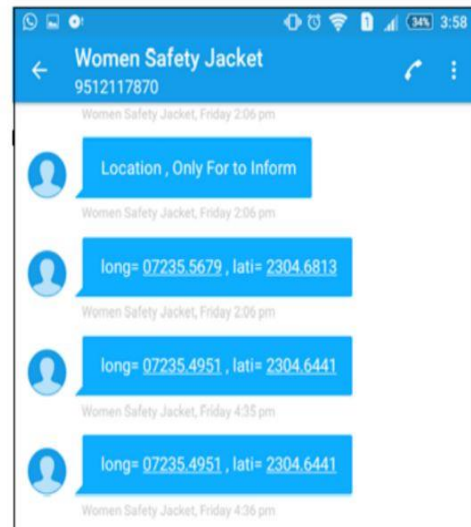
5.Results

A model with GPS REB-4216, GSM SIM300, SMD LED Module, Buzzer controlled by Atmega8A microcontroller acts as the prototype jacket (Fig 5.1) NMEA Latitude and Longitude data being received and is shown in LCD (Fig 5.2), below is the image of the system when switch 1 is pressed (Fig 5.3) and the GSM message received by the emergency contacts (Fig 5.4) the location on Google maps when received longitude and latitude values are entered (Fig 5.5).[6]

Figure 5.1: Prototype

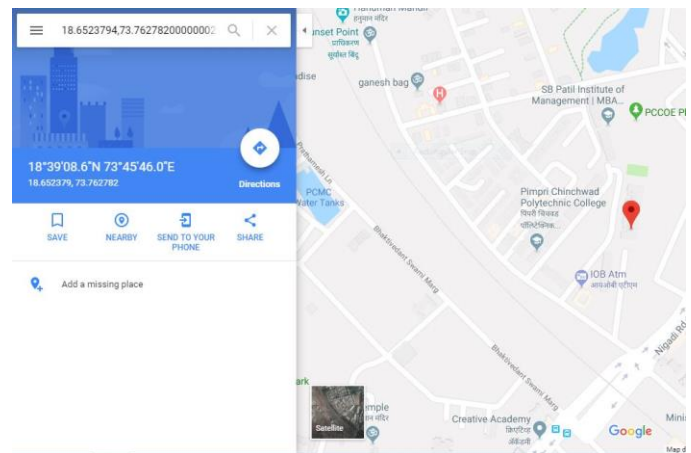Figure 5.2: Message on receiver mobile when switch is pressed

Figure 5.3: Location on Google maps

6. Conclusions

The proposed design will help the girl when she is in danger zone. She can make a rescue of herself in dangerous situations. And this circuit will use to remove or decrease the tension of girl when she walks alone at night hour also so that she will never feel helpless in any situation by herself. The crimes against women can be brought to an end with the help of real-time implementation of the proposed system. The system has been developed with such a motivation that it will leave no stone unturned to provide women with the safe environment under all the circumstances. As the system is fabricated into a jacket, no one would be able to evaluate whether it is a safety jacket or just a regular jacket.

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