

Pocket Cop

Dr. Kavitha R^{#1}, Naresh Ajay S^{#2}, Shobana Devi I^{#3}, Sruthi K^{#4}

¹Professor, ^{2,3,4}Student, Department of Information Technology, Velammal College of Engineering and Technology, Madurai, Tamilnadu, India.

Abstract

With the increased awareness and encouragement, modern women have started finding themselves in important positions. The free mobility of women has given them all the opportunities at the same time there are many challenges which need to be faced by them. One of the main challenges is to find ways to stay alert and safe in this society. It is an encouraging factor that with the available modern technology many different solutions are being found to assist in the security of women. The technology which is now being used is involving too many gadgets and devices. Much technology has been introduced in the form of wearable safety devices such as smart wrist band, smart ring for the safety of women. One of the main demerits of the available system is that the user needs smart phone with preinstalled apps to operate the device. The envisaged idea is something to do with smart clothing technology, quick responding and also cost effective protection system. It helps to inform nearby police station or any specific contact numbers when the women are in distress.

Keyword - smart wrist band, preinstalled apps, smart phone, smart clothing, cost effective

I. INTRODUCTION

Rape is the fourth most common crime against women in India[1].Especially, Madhya Pradesh has the highest raw number of rape reports among Indian states[2].In this world women are personified as a sacred creatures but in real life they are not. Every single day young girls, mothers, from all walks of the life are being assaulted, molested, and violated. The women need a safety measure when she moves out of the door.

With the increased awareness and encouragement, women in modern India have started finding themselves in important positions. They no longer confine themselves to their homes, villages or cities, districts or even states. The free mobility of women has given them all the possibilities at the same time there are many challenges which need to be faced by them. One of the main challenges is to find ways to stay safe while travelling to work or to do all sorts of assignments independently without the conventional human escorts. It is an encouraging factor that with the available modern technology many different solutions are being found to assist in the security of women folks. The technology which is now being used is cumbersome involving too many

gadgets and devices. Much technology has been introduced in the form of wearable safety devices such as smart wrist band, smart ring for the safety of women. The main demerits of the available system are that the user needs smart phone with preinstalled apps.

II. LITRATURE SURVEY

The status of women in India has gone through many great changes over the past few millennia. In modern India, women have adorned high offices in India including that of the President, Prime Minister, Leader of the Opposition and Speaker of the Lok Sabha. However, women in India continue to face social challenges and are often victims of abuse and violent crimes. According to a global poll conducted by Thomson Reuters, India is the fourth most dangerous country in the world for women and the worst country for women among the G20 countries. Following the Nirbhaya case of 2012 and the public outrage that it provoked, public safety for women has been increasingly deemed a political issue worthy of attention and concern, particularly in India's cities. Himmat, a safety app for Smartphone's launched by Union Home Minister Rajnath Singh in January 2015[3]. Enormous number of devices has been introduced in India particularly Nirbhaya's parents unveiled a portable safety device for women called Bhavani – which combines five engineering techniques – consists of features including a strobe light, non-lethal stun gun, a 10 foot throw distance pepper spray, panic button which when pressed will send five SOS SMS with GPS location to five pre-fed members/numbers [4].

A. GSM Enabled Wrist Watch to send distress message

Wristwatch developed by Vanshaj and Tushar sends distress signals and location coordinates of the user to the relatives of the user and to the police helpline number. This wristwatch uses Cell Tower Triangulation method to localize a user. It uses GSM module and 8-bit AVR microcontroller. [5].

B. Smart foot device for women safety

An attempt has been made to develop a smart device that can assist women when they feel unsafe. This smart device will be clipped to the footwear of the user and can be triggered discreetly. On tapping one foot behind the other four times, an alert is sent via Bluetooth Low Energy communication to an application on the victim's phone, programmed to

generate a message seeking help with the location of the device attached. The results obtained were analysed using Naive Bayes classifier and this low cost device showed an overall accuracy of 97.5% [6].

C. Smart Security solution for women based in IoT

The device proposed by Harikiran et al. is the integration of multiple devices, hardware comprises of a wearable "Smart band" which continuously communicates with Smart phone that has access to the internet [7]. The application is programmed and loaded with all the required data which includes Human behavior and reactions to different situations like anger, fear and anxiety. This generates a signal which is transmitted to the smart phone. The software or application has access to GPS and Messaging services which is pre-programmed in such a way that whenever it receives emergency signal, it can send help request along with the location co-ordinates to the nearest Police station, relatives and the people in the near radius who have application. This action enables help instantaneously from the Police as well as Public in the near radius who can reach the victim with great accuracy.

D. Abhaya : An Android app for the safety of women.

Abhaya, an Android Application for the Safety of Women, a single click on this app identifies the location of place through GPS and sends a message comprising this location URL to the registered contacts and also call on the first registered contact to help the one in dangerous situations. The unique feature of this application is to send the message to the registered contacts continuously for every five minutes until the "stop" button in the application is clicked. Continuous location tracking information via SMS helps to find the location of the victim quickly and can be rescued safely [8].

III. EXISTING SYSTEM

The review of the work done in the proposed area at National and international level were analyzed and many more mobile application devices are exist in the market and Google Play store. Some of the devices are listed here:**A.Safelet - Smartphone with Safelet app** Wearers of the Safelet safety bracelet can stay safe and secure with a guardian network. Invite friends, family, and others into the network, and they will be alerted with location and at any time by pressing the two buttons on the Safelet. Safelet works with the Safelet app on iOS and Android. The Safelet app is used to establish a Bluetooth low energy connection between Safelet and users Smartphone. Safelet notify the friends, family and the police when the user needs help. When the alarm is activated of the Safety Bracelet, the guardians will receive a notification that indicates the user will need help. When a guardian clicks on the notification it connected with map along with users location. The guardians that respond to the alarm will see each

other on the map as they are moving to the location of the Safelet user[9].

B. Siren

SIREN discreetly houses a startling, unbearably loud alarm that can be activated in less than 2 seconds. SIREN may serve as a powerful deterrent during the first few critical moments of an attack. The alarm is 110 decibels that is typical sandblasting or rock concert volume, and can be heard up to 50 feet away. SIREN is specifically designed to repel a close and aggressive threat, not to alert distant assistance [10].

C. Stiletto

Stiletto allows its wearer to send emergency message with the simple press of a button that looks like a semi-precious stone. By connecting the jewellery to a smart phone via Bluetooth, the corresponding app sends the wearer's location and helpful instructions to his or her emergency contacts [10].

D. Athena

Athena is a wearable device that is designed mainly for women. This is a wearable jeweler that can be worn as a pendant or can be clipped on to their dress or bag. Athena is a smart wearable device designed with an ability to produce an alarm of 85db - same decibel level that of a freight train on a long press on its button for about 3 seconds. This loud noise helps in averting the danger that is about to occur to the person in all means. Not only it averts danger at that particular moment, it also sends notifications to family members and friends about their condition with their current location. The device must be paired with their smart phone via Bluetooth, which enables to share the GPS at the time of emergency [11].

E. Revolar

Revolar wants people to feel safe at all time, so it designed the Instinct as a discrete wearable panic button that can easily be clipped to clothing items or attached to key chains. The gadget is quite small, so it's hardly noticeable. Wearers can activate the Instinct using clicks – one click (Check-In) will let a select group of people know you are home or in a safe location, two clicks (Yellow Alert) will share your location and concerns with them, while three clicks (Red Alert) will prompt the people in your safe circle to send emergency units to your location. The wearable works by connecting to an accompanying smart phone app via Bluetooth in order to provide real-time GPS information. Within the app, Instinct owners can customize alerts and alert messages [12].

F. VithU App

VithU, an app specially developed for emergency cases. Just the victim need to click the power button of the smart phone two times consecutively, and then it begins to send alert messages to the registered

contacts. The app will send the emergency text to the contacts. The receivers will receive those messages for every two minutes [13].

G. Circle of 6

It is fast, an easy-to-use and private. Originally designed for college students to prevent sexual violence and it is handy for teenagers, parents, friends, or all communities seeking to foster healthy relationships and safety. It is the mobile way to look out for each other on campus. A simple tool to prevent violence before it happens.

The main demerits of the available system which are discussed in the literature survey are, the user needs smart phone with preinstalled apps. In the proposed work an attempt is made to simplify the system with minimum gadgets and tools [13].

IV. PROPOSED SYSTEM

The block diagram of the proposed system is in Figure 1.

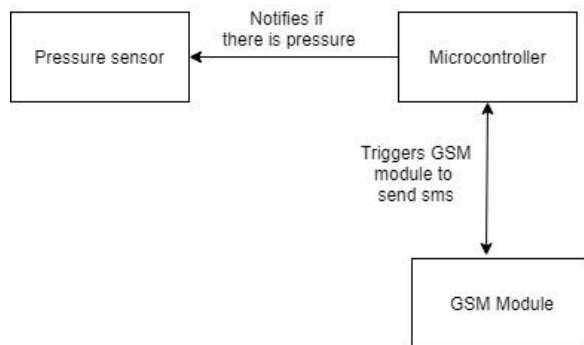


Figure 1. Main block diagram

As seen in Fig. 1 consist of a wearable microcontroller. The GSM module and pressure sensor are connected with the microcontroller with the conductive threads in the fabric. The smart device developed helps the women at trouble. When the women is in danger can crush the fabric or given pressure, it notifies to the microcontroller. The microcontroller checks whether the pressure sensor data is above the specified minimum value. If so, the microcontroller triggers the GSM module to send a message. It sends the message along with GPS location of the user to the contact numbers specified in the program. Any number of contacts can be included to send the message. It also performs the following task:

- Sends message to the family members along with the GPS co-ordinates.
- Then searches for the nearby police station contact number based on the GPS data.
- Co-ordinates is sent to nearest police station requesting immediate action.

When the system is given with power supply through battery, the pressure sensor sends the sensor data continuously to the microcontroller every 60 seconds.

The microcontroller continuously monitors the sensor data if there is any value above the threshold, it informs the GSM module to take further actions. The GSM module is notified to fetch the longitude and latitude information of the user. Then the co-ordinates values are converted to URL which can be viewed through the google map. The URL with emergency information is sent as SMS through GSM module to the victim's family members and nearby police station.

A. Pressure Sensor

The pressure sensor gives the digital output of the pressure in the sensor. The normal pressure value of the sensor ranges from 0 to 200 units. The microcontroller triggers GSM module only when the pressure sensor value is greater than 400 units. If the pressure sensor is crushed accidentally, it value may increase above 200 units to avoid this conflict the threshold value is fixed above 400 units.

B. GSM / GPRS Module

GSM module is used to send data from controller to base station. This module operated at the frequency Quad-band 850/900/1800/1900MHz. It is a compact GSM module which is 23mm x 35mm x 5.6mm in size. It is low power consuming which consumes 1mA during the sleep mode. It needs a micro SIM card and compatible with any 2G/3G/4G SIM. It requires antenna for connecting to base station. There are two antennas available for the GSM module namely helical antenna and slim sticker GSM antenna. The helical antenna is used here to reduce the space as it is compact. It receives the power supply from battery connected to the microcontroller.

V. RESULTS AND DISCUSSIONS

The circuit developed can be used by the women who need safety precautions say at travel, late night travel, home alone, etc...This weighs approximately 10grams. It needs to be charged for its usage. The message will be delivered to any number of contacts that are fed into the Lilypad microcontroller. The device is incorporated inside a smooth fabric which avoids damage to the device even during the accident. When the woman needs a help, she need to give pressure to the device or crush it. That notifies that the victim is in danger to her family along with the location. The location is given as URL in the message as seen in Figure 2 and it is easy to track the victim's location immediately and reduces time to view the location at the contact person's side. The location can be viewed through the Google Maps by clicking the URL sent in the message. A precaution for safety and well-being by simple message and helps the women to connected with her family at hazardous places and arduous situations. No more fear and uncertainty about women safety if the Pocket Cop is in women's hands.

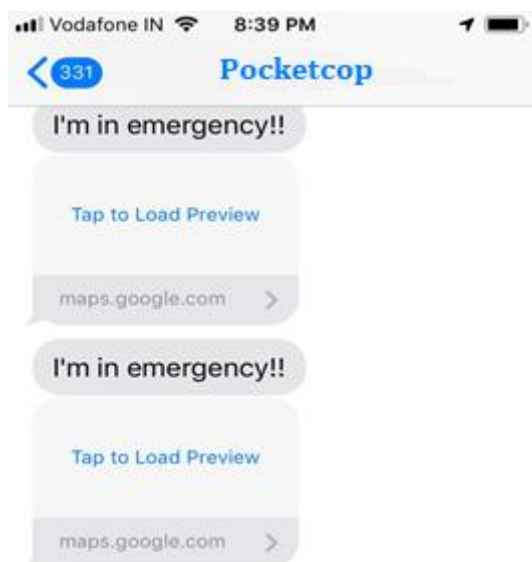


Figure 2. Message received from the Pocket Cop

VI. APPLICATIONS

The Pocket Cop developed has many uses and can be used for several other problems

A. Health monitoring

This device can be used for monitoring elderly people or children's health by employing various sensors for sensing the patient's health conditions such as pressure, pulse rate, temperature and glucose level. This sensor data can regularly monitored and sent to the patient's relatives if any abnormality found. When the patient feel abnormal, he can crush the device. Then the device sends message to their relatives and doctor who treat the patient.

B. Elderly people's guard

This device can be used for elderly people when they require any help. They can use it when they are facing any health problem or they met with any accident or when they lost in any public place. Through this device, they can notify their family members that they are in emergency. This device will send that the person is in emergency needing their help with geographical location of the person. So that their family members can reach to their location and help them to get out of the trouble. More than one phone number can be included which is useful when one of the relative is not reachable others can help them.

C. Child Monitoring

The device stitched with the fabric can be used for child monitoring when the parents are not home. They can continuously track their child and ensure their safety. This will be helpful for the security of the child

D. Physically Challenged guard

Physically challenged persons are facing many problems in their daily life. They face health problems, facing problems in public places such as crossing roads, finding right route to their home. They can't help themselves during emergency conditions such as when they pushed down by others, emergency health condition, kidnapped, met with accidents, lost their money or other accessories such as mobile phones. During such a situation they can use this device to inform their family members about their location.

VII. CONCLUSION

People respect and personify the Nature, Goddess, Nation, home to a women. It is not the same case in treating a girl child to an older women. Every single day young girls, mothers and women from all walks of life are being assaulted, molested, and violated. The women needs a safety measure when she moves out of door. The surveys conducted by several organisations also depict a dangerous society for a woman to live in [14]. Values are to be taught to the society than to a girl to dress well and project herself well. Assaults and violence on women is increasing every day, but the technology comes as a saviour. Technology provides a helping hand in safeguarding the eye of the world Women. The girl at hard situation can make use of the wearable smart device developed and relay the condition as a message. A small solution to the problem of women safety is introduced with the help of a smart device developed. In this work, the smart device that provides high security to the women. For designing this smart wearable with the help of wearable microcontroller. The location of the woman is tracked using the GPRS/GSM module with the help of antennas. The Location tracked is converted into URL by using the functions sketched. It is sent to the contacts stored as a message indicating their situation when the pressure sensor is crushed or given pressure. The entire circuit is connected by using the conductive thread instead of wires in a fabric which involves the idea of Smart Clothing or the E – Textiles. The smart wearable has several other applications too. It can be incorporated in this idea and many new solutions to the real world problems can be made possible. Assaults and violence on women is increasing every day, but the technology comes as a saviour. Technology provides a helping hand in safeguarding the eye of the world Women. The girl at arduous situation can make use of this Pocket Cop and inform her location details to her relatives and nearby police station. This information will be very helpful for both her relatives and police to track her down and save her.

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