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Women Safety Jacket

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Abstract: Women suffering violation are even denied of the basic human rights. Gender based violence has become a national as well as international agenda because of decades long struggles by civil society accompanied by women's movements. Though there are unprecedented numbers of laws against domestic violence, sexual assault and other forms of violence in each and every country to protect their female citizens to become a victim of any such violence but they are facing major challenges in implementing such laws. Thus making the society unjust and insecure for the women as in majority of cases the violator remains unpunished.

The atrocities against the women can be now brought to an end with the help of a device called Women safety jacket. It is to flash a warning giving an instant location of the distressed victim to the police so that the incident could be prevented and the culprit apprehended. This would help reduce crime against women.

Keywords: GPS, Buzzer, shock circuit, AT89C2051, Bluetooth module

I. INTRODUCTION

In global scenario, the prime question in every girls mind is about her safety and the harassment issues. The only thought haunting every girl is when they will be able to move freely on the streets even in odd hours without worrying about their security. This paper suggests a method to protect women. It focuses on a security device for women so that they will never feel helpless. The system consists of various modules such as shock circuit, buzzer, Microcontroller AT89C2051, Bluetooth module HC-05. An electronic jacket for women safety means that allow users to protect while traveling odd hours or when they feel helpless. It is based on women's security as it is reported that everyday there is many cases about women harassment.

It is a simple and easy to carry device with magnanimous functionality. The basic approach is to intimidate instant location and a distress message to the cops and registered number, so that unfortunate incidents would be averted and to provide real time evidence for swift action against the perpetrators of crime against women.

The security system for women which allows immediate response in case of any harassment and mainly focuses on two different parts, one is developed mobile applications for women safety and protection and secondly, the proposed work . The users can press a button that is located on device. The Bluetooth device is embedded with it and sends data to the mobile phone. Mobile phone app sends the messages to predefined contacts in which one is for information about location of the victim through GPS and message alert "HELP

II. PROPOSED WORK

A. Objective of the work is as follows:-

1) To design a device which is a security system specially designed for women in distress. To create a real time, reliable, secure and handy device which will intimidate instant location and a distress message to the cops and registered numbers if a woman feels she is in danger.

2) To provide an emergency switch attached to the jacket in an emergency situation women can press the switch. This will activate the shocker circuit through the relay which will ensure the security of women and prevent mishaps.

3) The hardware circuit can be divided into three parts: Power Supply, Microcontroller and Shocker circuit through Relay.

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Fig.1 shows block diagram of Women Safety Jacket

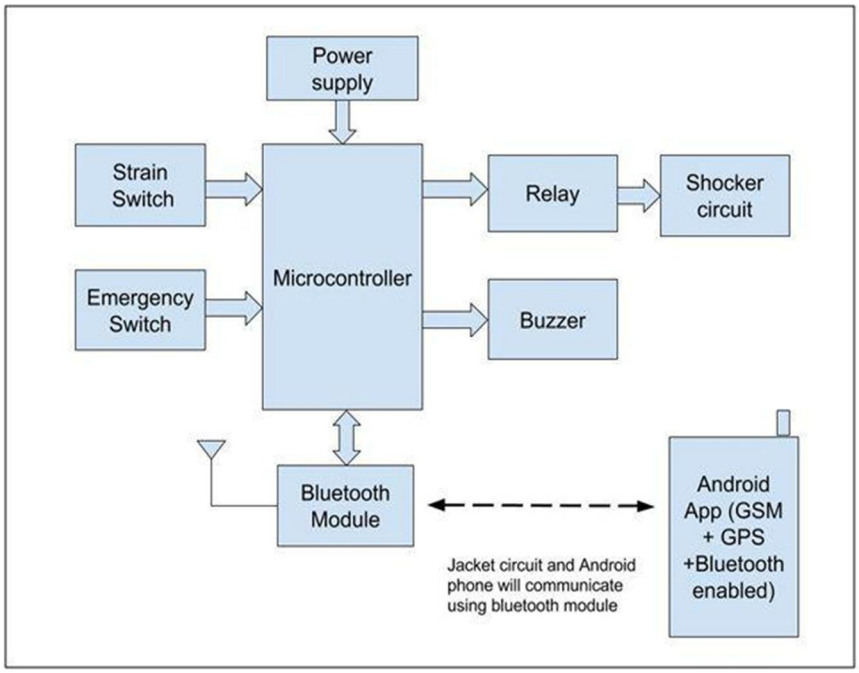


Fig.1 Block diagram of Woman Safety Jacket

B. Flow of Project

1) Mobile app needs to be connected with hardware circuit of Jacket via Bluetooth module.
2) In emergency situation women can press the Emergency switch attached to the jacket. This will activate the shocker circuit through the relay.
3) There is an alternate way if women is not able to press the switch then by stretching the wire the system can be activated.
4) Buzzer is used as alarm to generate beep sound in both the conditions.
5) he Bluetooth module is used to send signal to mobile when in danger case.
6) Mobile will send SMS to predefined number with location Using android app (This number will be stored in mobile app).
7) GPS is used to track live location and hence GPS of the phone needs to be ON.
8) On pressing the emergency button, the circuit will get activated and shock will be enabled onto the outer side of the jacket and it will be insulated in the inner side so as to protect the user from shock.

When a woman feels she is in danger, she can press the emergency switch which will be attached to the jacket. This will activate the shocker circuit and the buzzer will start ringing. The mobile application connected with the Bluetooth module will detect the signal and send HELP message along with the location to the predefined mobile numbers. This will ensure to provide an opportunity to the women to escape from the situation. In case of failure of emergency switch, the woman can stretch the strain wire provided to activate the circuit.

III. REQUIREMENTS

A. The complete project is divided in two parts

1) Hardware
2) Software

The hardware parts of the project include Power Supply circuit (consisting of Diode, LED, Capacitor, Voltage Regulator and Battery), Buzzer connected to Microcontroller (AT89C2051), Emergency Switch and Strain Wire connected to Microcontroller, Microcontroller interfaced with Bluetooth Module(HC-05), Shocker circuit through Relay(consisting of Diode, LED, Transformer, Transistor, Resistor, Capacitor), Jacket with shock providing etchings along with insulation to avoid shock to user, Android Phone to connect mobile with the hardware part of the Jacket through Bluetooth module.

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The software parts of the project include Android app creation (Using B4A software), using Keil uvision for microcontroller programming to interface hardware and software, PCB Layout using Eagle Software, UC flash for burning program into microcontroller.

IV. RESULT AND DISCUSSION

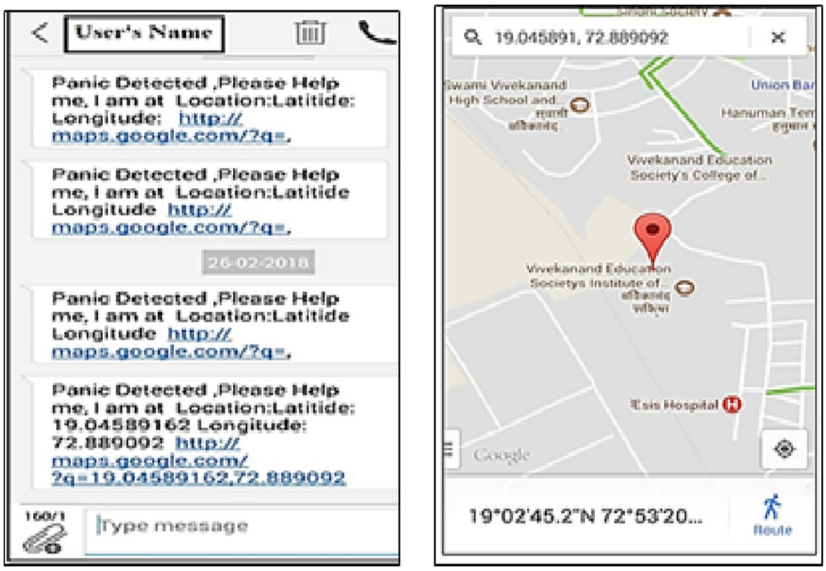
The circuit has two modes of operation, firstly by using the emergency switch, secondly by using an alternative method of strain wire. Both the modes were tested using multimeter and CRO to see the voltage output. When the circuit is switched on and the emergency switch was pressed, firstly the buzzer begins to buzz along with this current began to flow on the etchings of the jacket and a message is sent to the predefined numbers in the android app. As long as the emergency switch is pressed the current keeps flowing through the etchings on the jacket as a result we can obtain a voltage output of around 5V – 20V on the multimeter if the batteries weren't drained. If the batteries are drained the output voltage decreases but the minimum voltage that the circuit gives is around 3V. On the CRO output voltage waveform was obtained in the form of spikes and value of around 2.5V - 5V was obtained after peak to peak calculation. As soon as the switch is not pressed current stops flowing through the circuit also the buzzer stops buzzing. By using the alternative method of strain wire, we did not need to keep the emergency switch pressed. As soon as the wire is pulled the circuit breaks and buzzer buzzes and current starts flowing through the etchings. This method is used mostly when user is inaccessible to emergency switch. To stop current flow in the jacket in this method the strain wire needs to be twisted together to complete the broken circuit. In this mode no message is sent to predefined numbers via android app since in this mode Bluetooth does not serially transmit any data to the mobile handset. As soon as the emergency switch is pressed the Bluetooth device embedded within the jacket hardware sends data to the mobile handset through serial transmission. The 'help' message along with location in form of latitude and longitude details is sent to the predefined numbers stored in the android app. These numbers are stored by the user when user logs in the app for the first time. In case if the strain wire is used the help message will not be sent; only shock will be provided as temporary protection to the user.



Fig.2 (a). Login & password entry (b). Entry of predefined numbers (c). Connection & disconnection of Bluetooth via app

In proposed system with the push of one button, people can alert the pre-defined contacts that the person is in danger and share the location. With this personal safety app, you'll never walk alone!! In Fig. 2, (a) login screen is visible with password, the user has to enter login ID and assign a password to be logged in the application. After logging in a pop-up menu for enabling the Bluetooth appears if the Bluetooth is not activated on the handset. As seen in Fig. 2 (b) after activation of Bluetooth and GPS from the main screen, the screen navigates to the other screen where the user can enter at most 4 contacts to which the 'Help' message will be send when the emergency switch is pressed. In future the user has the facility to change the contacts and load new contacts by using 'clear' and 'load' buttons of the application respectively. After the desired contacts have been added then user has to press the 'save' button to save the mobile numbers in the app memory. In Fig. 2 (c) five different options are available, the 'connect' option connects to the Bluetooth of the hardware embedded in jacket, by clicking on 'disconnect' option the connectivity between mobile handset and jacket is terminated. The 'GPS' option is used for activating GPS on handset so that the current location of user can be available. By using the 'number' option the user can change the predefined numbers. The last option is 'map' which can be used to locate the position of the user by her; in case she is unaware of her current location

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(a) (b)

Fig.3 (a). Help message format on predefined number (b). Using Google map to locate the location of jacket user (location shown by a red marker icon)

When emergency switch of jacket is pressed current flows providing shock to the abuser and at the same time it sends the location URL as per latitude and longitude points from Google map, the Fig 3(a) shows the message format received by one of the predefined numbers stored by the user. By just clicking the location URL got from the message the guardian or the receiver of the 'Help' message gets the location where the person (i.e. user of jacket/women) is in danger, this is shown by a red marker icon in the Google map as shown in Fig. 3(b). By zooming the map guardian can easily find out the accurate location of the unsafe woman. For testing location accuracy the jacket user was in the campus of Vivekanand Education Society Institute of Technology (V.E.S.I.T), in Fig. 3(c) we can see the URL of help message shows the same latitude and longitude shown in Google maps.



(a) (b)

Fig.4 (a). Hardware mounted on jacket (b). Demonstration of the safety jacket after the user wears the jacket

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In Fig. 4(a). the entire mounting of hardware components is displayed. The entire hardware module is divided into two parts first, microcontroller and relay module second, transformer module. The microcontroller and relay module is placed on the lower right hand side of the jacket whereas the transformer module is placed on the inner backside of the jacket. The emergency switch and strain wire position can be varied depending on whether the user is comfortable using right hand or left hand in case of emergency or danger this is displayed in Fig. 4(b). Since the user is comfortable using right hand the emergency switch is placed on right part of jacket in the prototype. The silver strips on the sleeves of the jacket are the 'etchings' through which the current will flow when the user presses the emergency switch attached on jacket. The inner sides of the jacket where shocker wires are present are properly insulated with tapes to prevent the user from getting the shock. Basically any color of jacket can be used but in the prototype we have used black color so that it can suit any outfit the user wears also since it is a dark color doesn't get soiled or stained faster.

V. FUTURE WORK

A. The setup can be made detachable for day-to-day using, so that the same setup can be used on different outfits

B. camera can be attached to the device to click photos of the perpetrator and store in the device which can be used by police for investigation or other uses.

C. By using image processing techniques fear, distress or anger of user can be analyzed using camera and other sensors and automatic alarm or message sending operations can be performed rather than manually pressing the emergency switch. In short by using digital image processing techniques the circuit can be made partially automatic.

VI. CONCLUSION

The women safety jacket allows immediate response and mainly focuses on two different parts for protecting the women in distress, first is providing instant protection to the user by an alarming sound by using a buzzer, along with this shock is provided by the shocker circuit through relay. The jacket is internally insulated taking care of user's safety. Insulation is provided on the inside of the jacket by the means of insulation tapes which prevents the wires from coming in contact with the user. In the second part, the user can send real time location in form of latitude and longitude details to the predefined numbers using the android app installed in mobile handsets through GPS. Bluetooth transmits data serially.

The major limitation of power drainage due to continuously keeping the circuit on can be overcome by using small size battery like wrist watch size battery or rechargeable batteries like mobile phones, this would make the system more compact and light in weight. A battery level indicator along with alarm can be used to notify women about battery condition so she can replace or recharge battery on time. The other limitation where the 'Help' message is not sent when the handset is in airplane mode or sleep mode can be overcome by clubbing GPS and GSM facility in hardware side module the avoid dependency on mobile handsets.

Themain aim of designing this jacket is to implement a simple, reliable, comfortable and easy to carry device with magnanimous functionality for women which allows immediate response in case of harassment or assault providing protection in an affordable cost which can be easily endured by the common users.

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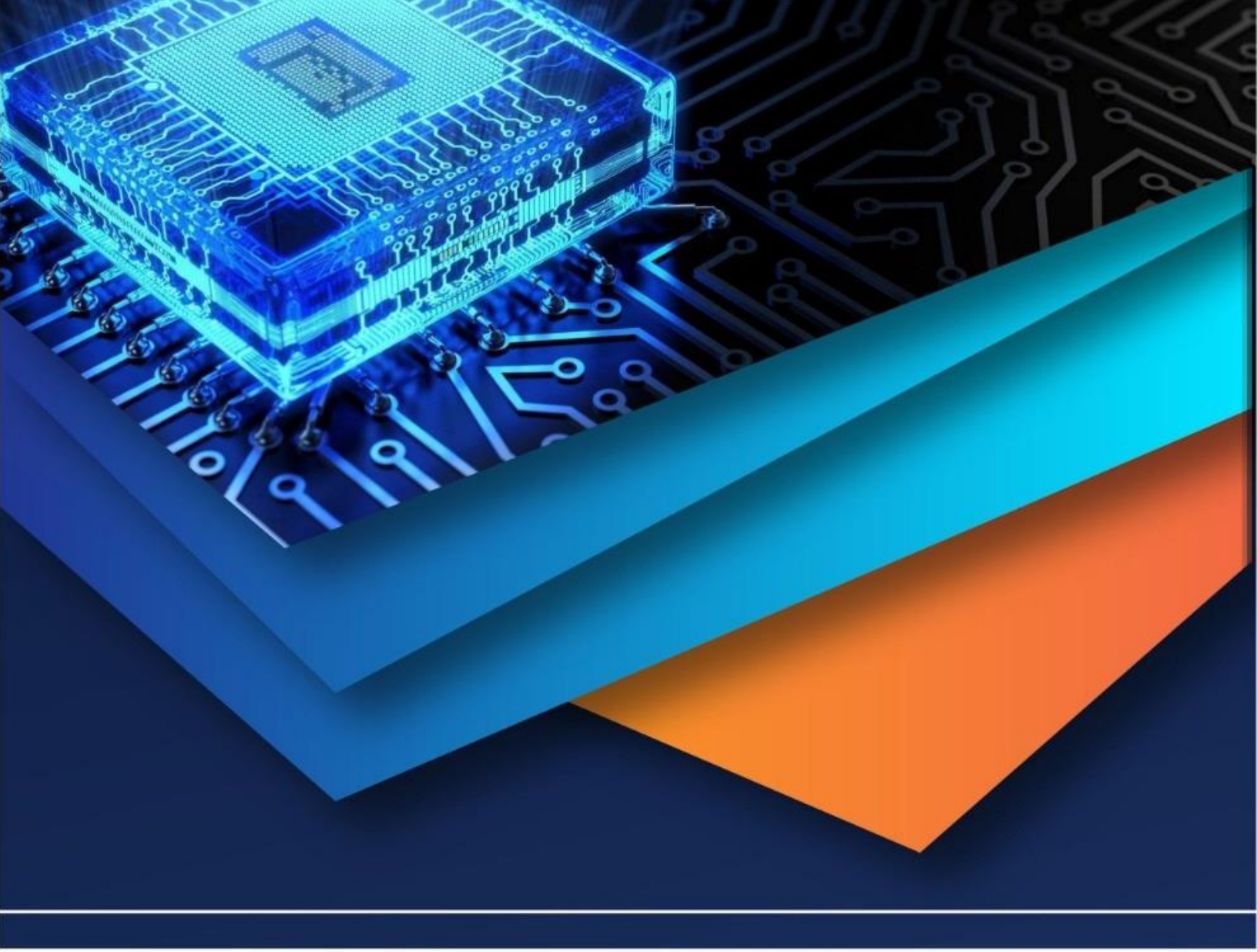
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