

Women Safety Patch-Up

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ABSTRACT

In this present world women are less secure and have various issues regarding their security. The National Family Health Survey-4 (NFHS-4) states that every third women in India are prone to various physical assaults and harassment, since the age of 15. There are many safety devices and applications that are in use today, but the usage of flex sensors as their major component limits the usage of those devices and applications. To overcome this disadvantage, it is proposed to develop a module with copper thread, ATMEGA328P, Global System for Mobile communication module, Global Positioning System module, RF Transmitter and RF receiver and Comparator as their major components. In this proposed work, there are two separate modules for transmitter and receiver. The transmitter module consists of a wire (patch-up) which can be stitched along with the dress of the women which are not externally visible to the culprit. There will be a connection flow between these threads which is continuously monitored by the comparator. When the connection flow terminates by breaking the patch-up, the comparator turns on the GSM and RF transmitter which is fused with the ATMEGA328P microcontroller. The GSM module sends the alert message along with the current location of the victim to the predefined numbers and the RF transmitter sends the signal to the RF receiver. A switch is used to turn on and off the entire transmitter setup. Once the device is activated it remains ON and does not need to be activated every time. On the other hand, the receiver module consists of an RF receiver and buzzer fused with a microcontroller. When the RF receiver receives the signal from the RF transmitter, it turns on the buzzer. Hence this method ensures emergency call and alert message along with the location of the victim to the predefined numbers through mobile phone. In emergency cases the person themselves can open the patch or alert the switch to send alert messages.

Keywords: Women safety, safety patch up, GSM, GPS, RF transmitter & receiver.

1.Introduction

Women in India-a better half of Indian society, today, are becoming the most vulnerable section as far as their safety and security is concerned. When anyone turn the pages of a newspaper, we come across many headlines reporting cases of sexual assault, molestation, sexual harassment, rapes, etc. This certainly implies that there has been an increasing trend of such sexual overdrives in present generation. To reduce the crime against women, there are many devices and applications that have been proposed earlier. But usage of flex sensor and various other sensors as their major component reduced the usage of those applications and devices as there is a large chance of false alerts when the sensor value cross the fixed threshold value. So, to overcome this, a method is proposed which has wire patch-up, GSM module, RF transmitter and receiver and ATMEGA 328P microcontroller as their major components. This method consists of two separate modules for transmitter and receiver. The patch-up (wire contact) can be stitched along with the dress of women. There will be a connectivity flow between the wires. The transmitter consists of GSM and RF transmitter. GSM

module sends alert message along with the location of the distress and makes emergency calls to the predefined numbers when the thread is broken by the victim and the RF transmitter sends signal to the receiver over RF network. The receiver module consists of RF receiver and buzzer. The RF receiver turns on the buzzer when it receives signal from the RF transmitter from RF network. At emergency cases the person themselves can break the patch to send alert message. Additionally, an emergency button is connected to call the receiver for buzzer up.

2.Motivation

Women safety is considered as the first priority in the society. It is important for everyone from government to corporate and individuals to come together to make India a safer place for women to work and live. There are numerous stories of girls being raped and molested in the internet. Sexual violence against women and girls does not discriminate by race, religion, culture, class or country. Worldwide, one in three women have experienced sexual violence, and more than 15 million girls aged 15-19 years have experienced rape. As girls and women are placed in insecure environments, it's necessary to ensure their safety.

3.Objective

To provide a reliable security system for a woman and to ensure low latency in delivering the warning message and making emergency calls. One can ensure longer connectivity of the device by providing two separate modules for transmission of message from transmitter module and blowing of buzzer from the receiver module.

4.Scope

In this modern world, the crime against women is also rapidly increasing. The scope of the proposed system is to provide a safety device which can help women at distress situation and this device is not externally visible to the culprit. The system enhances a wearable device which can be stitched along with the dress of women. This will make the women feel safe and provides much sort of security. The proposed system can be activated through ON/OFF switch and once it is activated it remains ON even without handset.

Once the connection flow between the ends of the thread is terminated, this system ensures emergency call and alert message along with the location of the victim to the predefined numbers through GSM module. Buzzer is used to provide loud noise which gives a panic attack to the culprit.

5.Proposed System

The device gets started once the power supply is given. The device can be activated through ON/OFF Switch, when a woman feels that she is under threat. Copper wire (Patch-up) can be stitched along with the dress and the connection flow between the thread is continuously monitored by the comparator.

Once the connection flow between the ends of the thread is terminated by breaking the patch, from the transmitter module emergency call and alert messages along with the location of the victim is sent to the predefined numbers through GSM. RF transmitter sends signal to the RF receiver through RF network. When the RF receiver receives signal from the transmitter it turns on the buzzer in the transmitter module.

The architecture of the transmitter as shown in the figure consists of ATMEGA 328P microcontroller which is the main source. It gets input signals from the comparator when the connection flow between the ends of the thread is terminated by breaking the connectivity of the patch. Then it gives input to the GSM and RF transmitter.

The GSM module that is described in the transmitter module is SIM800C, it sends alert message and makes emergency call to the pre-set numbers. The RF transmitter sends signal to RF receiver through RF network. The receiver module architecture consists of Nano ATMEGA 328P microcontroller. It gets its input signal from RF receiver. Once it gets the signal it turns on the buzzer.

6. Block Diagram

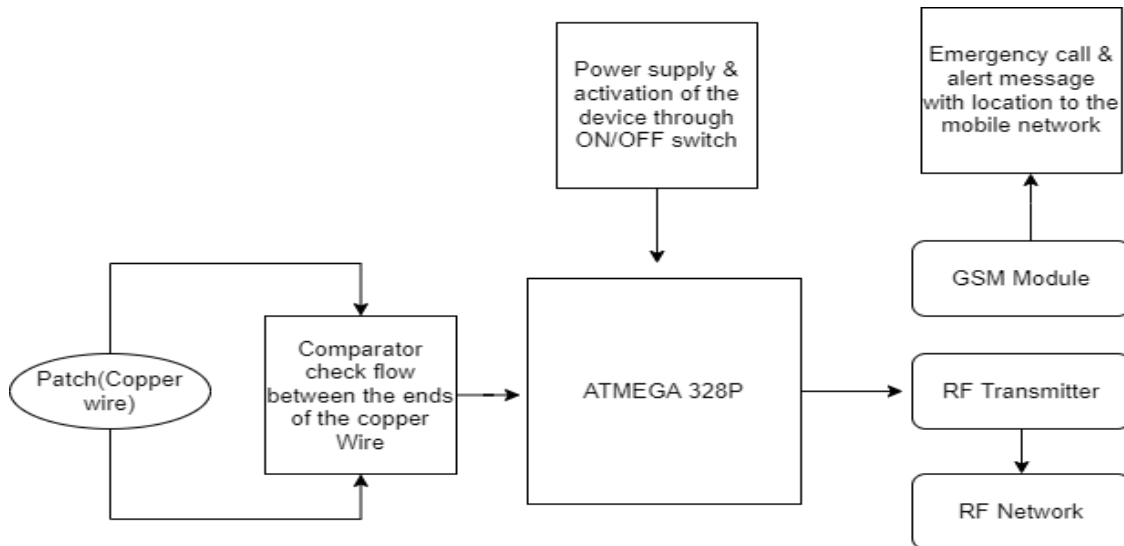


Fig.1. Block diagram of RF transmitter

The device is ON when it gets connected to power supply. Once the device is activated the comparator continuously checks for the connection flow between the patch. Once the connection flow is terminated, the comparator pushes the microcontroller to turn on the GSM module and a buzzer in the RF transmitter will be activated and turned ON. The GSM module sends alert message to the predefined number. If the connection of the wire is not terminated then the women can turn ON the emergency button, then the signal will be sent to the receiver and a buzzer in the RF receiver will be activated. The RF receiver should be at a distance of within 30-meter radius nearer to the RF transmitter. At that time the RF transmitter sends the signal to the RF receiver through RF network.

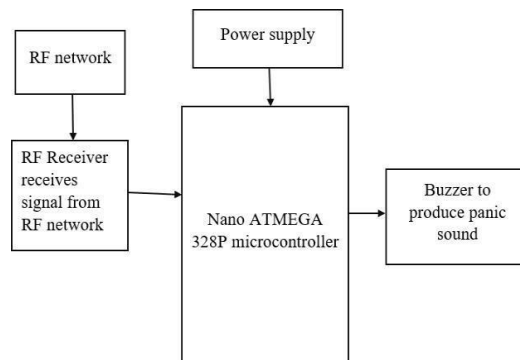


Fig.2. Block diagram of RF receiver

The device is ON when it gets connected to power supply. RF receiver receives signal from the RF transmitter through RF network. It passes the signal to the microcontroller. Once the microcontroller receives the signal it immediately turns on the buzzer to produce sound.

A RF module (short for radio-frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly. This wireless communication may be accomplished through optical communication or through radio-frequency (RF) communication. For many applications, the medium of choice is RF since it does not require line of sight. RF communications incorporate a transmitter and a receiver. They are of various types and ranges. Some can transmit up to 500 feet. RF modules are typically fabricated using RF CMOS technology. The RF module, as the name suggests, operates at Radio Frequency. The corresponding frequency range varies between 30 kHz & 300 GHz. In this RF system, the digital data is represented as variations in the amplitude of carrier wave. This kind of modulation is known as Amplitude Shift Keying (ASK). Communication over Radio Frequency has many advantages as it doesn't require a line-of-sight connection between the transmitter and receiver as in case of Infrared communication.

The range of RF communication is very high when compared to IR communication. In this project, a wireless transmitter and receiver system using RF modules (RF Transmitter and RF Receiver) is implemented. Transmission through RF is better than IR (infrared) because of many reasons. Firstly, signals through RF can travel through larger distances making it suitable for long range applications. Also, while IR mostly operates in line-of-sight mode, RF signals can travel even when there is an obstruction between transmitter & receiver. Next, RF transmission is stronger and more reliable than IR transmission. RF communication uses a specific frequency unlike IR signals which are affected by other IR emitting sources.

7. Results & Discussions

The proposed system continuously monitors the connection flow between the ends of the patch-up when the device is activated through ON/OFF switch. When the connection is terminated by breaking the patch by the victim during distress situations or when she feels that she is under threat, the system sends panic alert message along with the longitude and latitude position of the victim to the predefined numbers through GSM module at transmitter module. When the emergency switch is activated then the emergency alert message is sent to the predefined numbers. The buzzer is turned on to produce sound which acts as panic attack to the intruder at the receiver module.

The figure shows the final designed transmitter module containing GSM module, comparator and RF transmitter which is stitched inside the dress of the women.

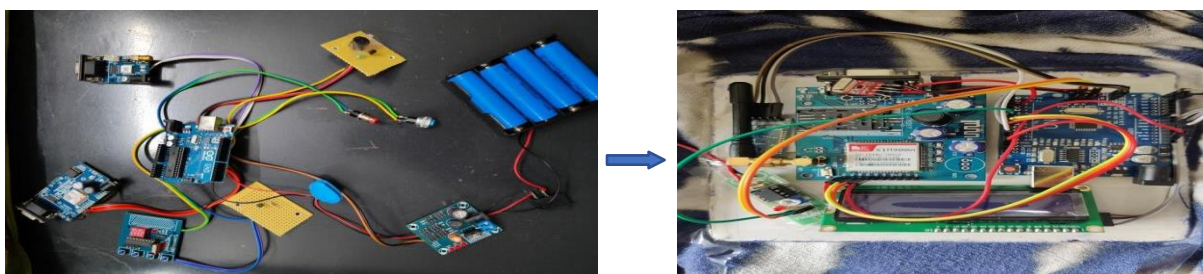


Fig.3. Transmitter module

The figure shows the receiver module which can be carried along with the bag or purse of the woman. It consists of RF receiver and buzzer.

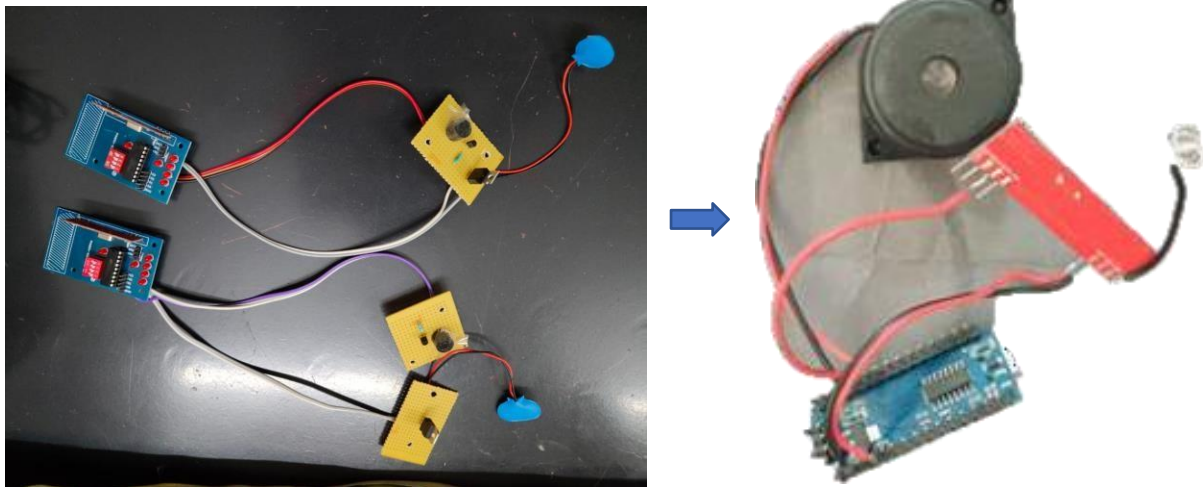


Fig.4. Receiver module

When the connection between the ends of the patch is terminated, the transmitter module sends a panic alert message along with location of the victim to the predefined numbers which is shown in the figure and if the emergency button is activated then an emergency alert message is received along with the location details. The receiver module blows the buzzer to produce the panic sound.

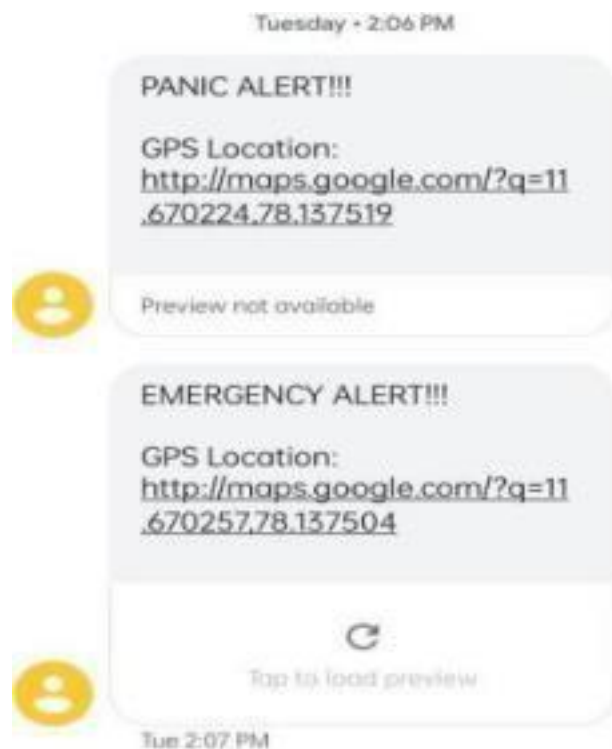


Fig.5. Alert message

8. Conclusion

Appealing to the requirement of women security outside the home, man approaches of providing security to user through mobile application and safety devices have been explored but the main drawback on them are they use various sensors for monitoring their physiological conditions, at times which may lead to false alert. The proposed system consists of separate transmitter and receiver module. A wire patch-up along with the transmitter module is fixed in the dress. At distress situation if the connection is broken by the victim the system sends an alert message to the predefined numbers through GSM and the buzzer is turned on. The error probability is reduced by not using any sensors. It is more accurate when compared to existing system. This device will be very much useful to women. It is practically possible one and economically comfort to use.

Future Scope

Physical harassments and violence against women are the serious issues as far as the safety of women is concerned. Thus, it is much wanted to develop a system which ensures security of women outside the house. This proposed system can be developed into a compact wearable device. All the users of this device can be connected under a network with individual user id containing the location and information of the user. So that when a person is attacked the users nearby her can help. However, in future, additional feature of taking the image of the crime and sending it directly to the nearby police station by using computer module can be made. Therefore, the device can be developed with much security cases for ensures the safety.

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