

A SMART BAND FOR WOMEN SAFETY

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Abstract - Today girls were not allowed to move freely even in the streets without worrying about their security. Parents are worrying about their security which has become the first barrier to send their daughters for job. Day by day the women harassment increases. We can't change the society totally but we can increase the security of girls by using modern technology. The proposed system for women consists of a wearable safety device which operates automatically when the pulse rate increases, when women are exposed to harassments in the society. Here the security for the women is provided by the continuous monitoring of the pulse rate. The pulse rate are detected by using pulse sensors. When the rate of pulse is increased more than that of normal rate, the device get activated. A mobile app is used for location tracking. This app searches for the nearest available police station and an alert message along with the location details are sent to them. The message is also forwarded along with the location details to the already added emergency contacts.

Key Words: Pulse Sensor, Arduino Uno, GPS, Bluetooth, Safety

1. INTRODUCTION

Women safety in India is a big problem, Safety of women matters a lot whether at home, outside the home or working place. It is very true that women in India are given a place of Goddess Lakshmi in the Indian society however we also cannot ignore the negative aspect of women position in India. Areas like streets, public spaces, public transport, etc have been the territory of women hunters. Safety of women in India is a vast topic now-a-days. We cannot say that women are safe in India by seeing the last few year crimes against women especially in the national capital. Women generally are afraid to go alone outside. It is a very sad reality of the country that its women citizens are living with fear all time. Personal safety of women has been the topic of importance for every Indian citizen.

Despite of formation of various effective rules and regulations by the Indian government to handle and control the crimes against women, the number of crimes against women are increasing day by day. The status of women in the country has been more offensive and dreadful in the last few years. It has decreased the confidence level of women for safety in their own country. We should not blame the government because women safety is not only the responsibility of government only, it is the responsibility of every Indian citizen.

Women in India known as the better half of Indian society, today, are becoming the most vulnerable section as far as

their safety and security is concerned. This surely indicate that there has been an increasing rage of such sexual overdrives in present generation. Rape is the fourth most common crime against Women in India. According to latest National Crime Records Bureau (NCRB) 2013 annual report, 33,707 rape cases are reported across only India. The number of reported rape cases has been steadily increasing over the past decade. A step towards curbing incidents of this heinous crime is to develop a device that can sense the impending danger automatically and help in rescuing the victims from such act. Research shows that such devices exist commercially but requires manual pressing of button to trigger alarm. Since the mental state of women as well is children is affected during such act consequently manual pressing of button is not ideal.

The citizens of India, have to take up some fundamental duties to contribute towards bringing an order to ensure dignity and respect for women so that she can also enjoy her human rights and fundamental rights with sense of pride, freedom and confidence. To ensure this, the society must work together to give an edge to the solution. For example, women in the society must be provided with devices with latest technology which provides her location using GPS technology to a central control room of police or send messages of her address to nearby locations.

Public outrage after the brutal rape and murder of the 23 year old student, "Nirbhaya" in Delhi on 16 December 2012 has focused greater attention on necessity for holistic measures for security and safety of women. Sadly despite a strong legislation there has been no reduction in incidents of assault and physical abuse of women underlining larger socio-political ills and environmental changes in Indian society today. The underlying trends may seem aberrations in male behavior but these have become so pronounced in recent times and their ill effects so damaging to society at large that these need blunt assertion. It has always been a concern for many people and communities around the world. It becomes evident when we look at various happenings taking place around the world, where the identity of woman has been misunderstood by a few

individuals in the society and an attempt to harm a woman's social status has been made and while it may be decades or centuries before the world becomes a safer place for us, there are several things we can—and must—do to protect ourselves.

2. LITERATURE SURVEY

Projects like VithUapp, Nirbhaya, Spot N Save Feel Secure app were introduced lately. But the most of them had many

disadvantages over advantages. Firstly the concept was done by the app VithU mobile app. In this app when the user faces any challenges, Alert messages are sent to the listed contacts, which can be saved prior itself. The message is sent along with their physical location to the already saved contact. But the disadvantage of this app is that we have to click the power button for 2 times consecutively, which is not possible at all the situation.

Nirbhaya, a Pune based software company has launched in 2012 named after Delhi gang Rape. It can send a distress message to a specified contact group in an emergency situation confronting a woman. They will send an alarm by way of an SMS denoting woman's location to the configured group through GPS. It also gets updated on every 300 meters of move. The users can configure their own list of contacts incorporating police and other close relatives and friends. The major drawback of this app also is that it is physically dependent ,that is not possible in all situations.

Spot N Save Feel Secure app is a special portable smart band which works along with this app. The working of this app is by clicking on the button on the band twice to send out signal to the guardian network. Signal will be updated every 2 minutes. This app is not applicable in all situations since for an unnoticed situation or unpredictable time, users can't make alert previously by clicking it twice.

Stay Safe (SOS) is another powerful personal safety app that permit you against acts of violence, and helps someone in the case of an emergency. SOS – Stay Safe is an application which is useful in a large range of possible dangerous situations like being stalked on the way home, attempted physical or sexual assault, domestic violence, road accidents or medical emergencies. The working is by pressing the power button of phone three times in succession. It automatically sends an emergency message to friends and family along with your location and device battery level. The app allows you to get help effortlessly and discreetly without raising any suspicion. The GPS tracking helps the recipients track your exact location. This app also has an disadvantage such that if girls fail to shake or click button or if girl become unconscious, this app is not worth for the sure safety.

365 Security Guard provides the user with 120db personal alarm with high intensity LED flash light, Safety hammer, Belt cutter and a portable charger. But since it is not so portable they cannot be carried everywhere. It doesn't give any assurance that this device can be carried for all the places the girls move.

In our paper, this device can be carried while travelling. Alert message notification and calling option is available in this mobile app. After detection of pulse, if the detected pulse is higher, the message is sent to both the emergency contacts as well as nearest police station along with the detailed location details. This mobile app also provides with an extra facility of cancel option. If the variation in pulse is because of some other factor, then a cancel button is also been provided in the

app. If the cancel button is pressed, then the message get cancelled.

3. METHODOLOGY

3.1 HARDWARE

- Pulse Sensor
- Arduino Uno
- Bluetooth Transceiver Module

3.1.1 PULSE SENSOR

The Pulse Sensor is a pulse rate detecting device Normal heart rate of a human is from 70 to 90. This sensor senses the pulse rate by clipping it in the finger tip. This has two side, one is front side which is a heart shaped. This is the side that makes contact with the skin. On the front a small round hole is present, and here it is where led shines its light. Under the LED light a small little square is present That is ambient light sensor like used in laptops and mobile phones .This is mainly used to adjust the automatic brightness according to the situation. The LED shines light and sensor reads the light that bounces back. Still there are so many parts at the back side of the sensor. At the back side all other parts got mounted.



Fig -1: Pulse Sensor

3.1.2 ARDUINO UNO

The Arduino UNO is considered as a basic development board to create digital devices and interactive objects that sends and controls physical devices. The board is embedded with sets of digital and analog input/output (I/O) pins that may be interfaced to various shields and other circuits. The board consists of 14 Digital pins and 6 Analog pins. It is programmable with the Arduino IDE, which is an open source software via a type B USB cable. It is powered using a USB cable or by an external 9 volt battery, though it accepts voltages between 7 and 20 volts. The ATmega328 on the Arduino Uno comes preprogrammed with a bootloader that allows to upload new code to it without the use of an external hardware programmer.



Fig -2: Arduino UNO

3.1.3 BLUETOOTH TRANSCEIVER MODULE

The Bluetooth transceiver module is used as UART RS232 serial converter module. It can easily transfer the UART data through the wireless Bluetooth, without complex pieceB layout or deep knowledge in the Bluetooth software stack, can also connect this Bluetooth module with devices such as MCU, ARM or DSP systems, GPS or GSM, Sensor modules, SOC systems.



Fig-3: Bluetooth Transceiver Module

3.2 SOFTWARE

In this system when the pulse rate crosses the threshold pulse value, then the system gets connected with the built mobile app named as "Third Eye". The device and the mobile app is connected through Bluetooth using Bluetooth transceiver module. The mobile app is built using Android Software-Android studio.

Android Studio is the official integrated development environment for Google's Android operating system, built and designed specifically for Android development. Android Studio supports programming languages like Python, and Kotlin and the latest version is Android Studio 3.0.

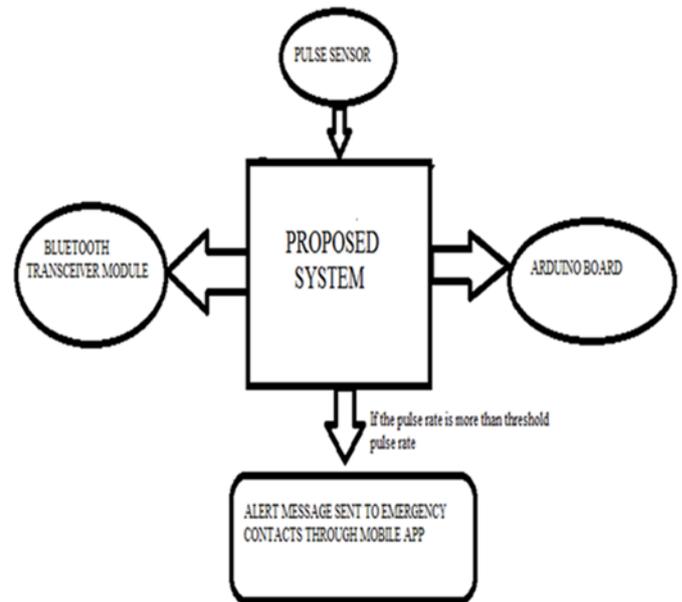


Fig-4: Architecture of Proposed system

Fig-4 shows the architecture of the proposed system. As the crime against women are increasing day by day, this sytem is very helpful since it is very portable. The pulse sensor implanted on this will detect the pulse rate from wrist or from finger tip. When the detected pulse rate increases more than that of the normal pulse rate, it automatically gets connected to the mobile app provided. In the mobile app, the emergency contact to be contacted are already saved. In the time gap of 15 second a cancel option along with a vibration gets into action. Even after the time of 15 seconds, if the cancel button is not pressed, then the call gets connected with the emergency contact provided. A message is also sent to the emergency contact provided along with the user's location. This message is also forwarded to police station/helpline number.



Fig-5: Developed Prototype

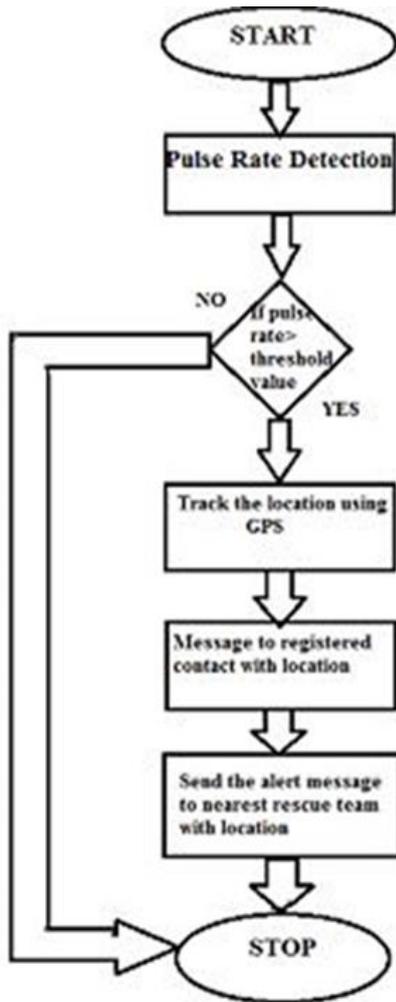


Fig-6: Flowchart of Proposed System

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4. CONCLUSION

This work attempts to keep women safe, it's a portable device so it can be easily carried to any places. This device continuously monitors the pulse rate of user wearing it , if the pulse rate is above the threshold then the signal will be send to mobile application through Bluetooth module and the application indeed sends alert message and call to registered contact. Further an alert message will be sent to police station/Helpline. User don't have to press any button to give an alert message, this is an automatic process. This device is inexpensive, so that common women can use it while travelling outside.

5. FUTURE WORK

In Future, additional features can be added to the hardware like camera and sound recorder so that live updates of user can be observed and provide safety measures in case of danger. And latest versions of hardware can be used to improve the performance.