



## **A Review Paper on Women Safety Device with GPS Tracking and Alerting**

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### **ABSTRACT**

To the best of our knowledge, women and men are equally responsible for their many fields of endeavor and enjoy equal rights in the present era. As women are given the opportunity to work both even and odd shifts and are placed on an equal basis with men across all industries. Every day, rapes, moles, and other forms of abuse occur to women and young girls from all walks of life. The streets, public spaces, and public transportation in particular have become the hunters' hunting grounds. Women are unable to leave their houses for the following reasons. The only thing on a woman's mind is when she'll be able to go about the city at any time of day without fearing for her life. Our idea is to create a hardware device that combines several different gadgets into one wearable "smart gadget" that can connect to the internet and talk with a smart phone constantly. In addition, the entire device guarantees self-defense functionality, assisting her in evading dangerous circumstances. Locations such as bus stops, train stations, workplaces, sidewalks, retail centers, marketplaces, etc. can use this system. This project uses an Arduino Uno together with several sensors like an accelerometer, heart rate sensor, siren, and GSM to describe a safe and secure electronic system for women.

Keywords: Arduino UNO, Accelerometer, Heart Rate Sensor, Siren, and GSM.

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### **1. Introduction**

Every economy is built on women, who also have a major role in shaping the direction of the country. She is now managing her job and home simultaneously and participating in economic development on an equal footing with males, having previously stayed at home to take care of her household duties. The Indian government changed the Factories Act of 1948 to allow women workers to work nights in response to repeated demands for gender parity in the workforce. Women can only work nights, per the amendment, if their employers ensure their safety, protect their health and safety at work, give equal opportunities to all female employees, appropriately protect their honor and dignity, and provide transportation from the factory to the closest location for. While night shifts have been around for a while, women were not legally permitted to work night shifts in India until recently, according to a 1948 Factories Act change. Women are engaged in practically every aspect of the economy.

We can observe how many women are employed and running their own businesses, adding to the nation's GDP from hamlet to city. 60% of working women are currently employed in garment factories, and as the industry grows, this percentage will rise further. Women have historically been employed in the IT industry for late-night work hours, although they are not required by law to perform the aforementioned safety precautions. There is no doubting that Indian women have made significant progress. In contemporary Indian society, there are still a lot of malevolent and evil forces at play that impede the progress of women. Women now work night shifts due to the rise of the IT and BT industries. The company is obligated to offer these workers with office transportation. Even while firms now offer transportation services, women's security is still not completely guaranteed, as seen by an event that happened in 2007.

#### **1.1. Structure**

- The position and location of the victim traced by the GPS.
- The system makes use of GPS, and a GSM modem is used for two-way communication.
- This gadget is a security system made especially for troubled women.
- The Women Safety Device and Application is created utilizing a smartphone that is paired with Bluetooth, allowing for immediate location tracking.

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## 2. Literature Review

[1] Smart Foot Device for Women Safety," Institute of Electrical and Electronics Engineers, volume 16, pages 130–134, 2016, N. Viswanath, V. Pakyala, and G. Muneeswari. This study develops a sensible gadget for women's safety. The user will be able to covertly activate this smart device, which will be attached to their footwear. For the gadget to interact with the application, it needs to be associated with the user's smartphone. No unauthorized person may therefore connect to the device. Once every second, the device's acceleration sensor will detect the acceleration values in the x, y, and z axes. Upon receiving the warning from the gadget, a smartphone application is configured to transmit its location to four pre-specified contacts.

[2] M. Fathila, A. Helen, and R. Rijwana, "A Smart Watch for Women Security based on IOT Concept Watch Me," Institute of Electrical and Electronics Engineers, number 17, page 190-194, 2017 This research presents a novel approach using smart watches. The "watch me" device's sensor detects a person's elevated heart rate at that precise instant and activates when a woman or child wearing it is the target of a sexual or vulnerable attack. The whole process is based on the fundamental idea of activating the heartbeat sensor upon reaching the desired heart rate and duration. Then watch me instantly notify the local police station of an incoming threat. Police can use GPS to track the position.

[3] G. Harikiran, K. Menasinkai, and S. Shirol, "Smart Security Solution for Women based on Internet of Things (IOT)," Institute of Electrical and Electronics Engineers, vol. 16, pp. 3551–3554, 2016. This method's suggested wearable "Smart band" can maintain continuous connection with a smartphone that has internet access. The application has been developed and is completely loaded with all the required data, which includes human behavior and reactions to different situations, such as anger, fear, and worry. The pre-installed app on the phone keeps track of all the information gathered by the smart band, such as the user's movements, heart rate, and body temperature. Installing the software on a smartphone allows users to access a social network and engage in real-time message receiving.

[4] "A Mobile Based Women Safety Application (I Safe Apps)" was published in the January–February 2015 issue of the IOSR Journal of Computer Engineering (IOSR-JCE) by Dr. Sridhar Mandapati, Sravya Pamidi, and Sriharitha Ambati. By pressing a single button, users of the suggested system can broadcast their position and notify a limited group of contacts that they are in danger. You will never be alone when using this software for personal safety. The name and phone number of the person who should be contacted in an emergency are required by the personal safety application. Multiple users can be added to the emergency contacts list. In the event of an emergency, alerts or SMS will be sent to these individuals. It just needs the user to press the designated SOS button to start shooting messages as quickly as the device can.

[5] Manita Rajput, KTV Reddy, and Madhura Mahajan "Department of Electronics and Telecommunication, Fr. C. Rodrigues Institute of Technology, Vashi, Navi Mumbai, India: Design and Implementation of a Rescue System for Safety of Women." The emphasis in this literature is on developing a safety system that results in a resolution that guarantees the victim's defense as well as the establishment of a smooth road for starting any necessary legal actions. Our goal is to develop a semi-wearable that can offer a full security solution and function as a tool to reduce anxiety in women and their families. The purpose of this literary work is to develop a portable safety gadget that serves as a safety system for women performing the following tasks: Notifies the police and relatives

[6] Women Employee Security System using GPS and GSM Based Vehicle Tracking, Poonam Bhilare, Akshay Mohite, Dhanashri Kamble, Swapnil Makode, and Rasika Kahane, International Journal for Research in Emerging Science and Technology, volume 2, issue 1, January 2015. This paper proposes a car tracking and female employee security system that uses GPS and GSM technology. It combines specialized software with a GPS device to track the location of the vehicle and send alerts and messages that include an emergency button trigger. Google maps can be used to view the position of the vehicle as reported by the gadget.

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## 2. Problem Definition

Physical harassment is currently one of the most common and regular offenses against girls and women in India. In urgent situations, women are unable to operate and protect smartphones. She is also unable to add an alert feature, so in an emergency, they are unable to pass and let family members and law enforcement know where they are. She then need a device that will alert her parents to the danger and shield her from attackers.

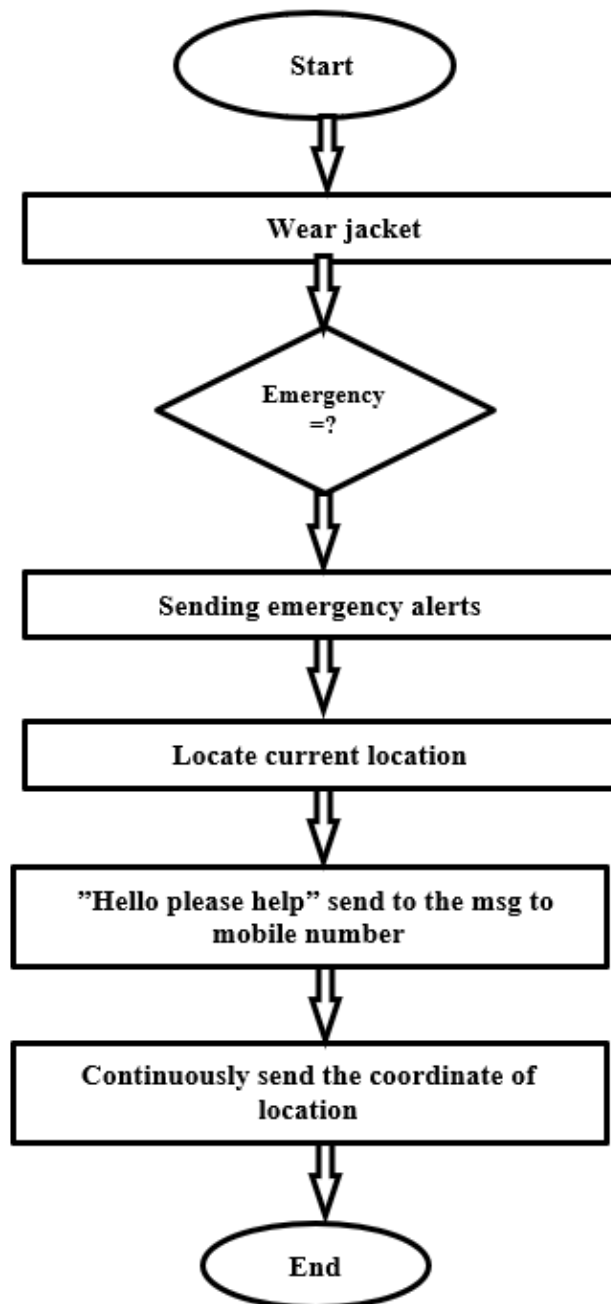
Parents today believe that their daughter is not safe in this generation, therefore even if the job is favorable to them, they will not let their daughter to work night shifts. The problem of the abundance of qualified candidates stops her advancement.

### 2.1. Objectives:

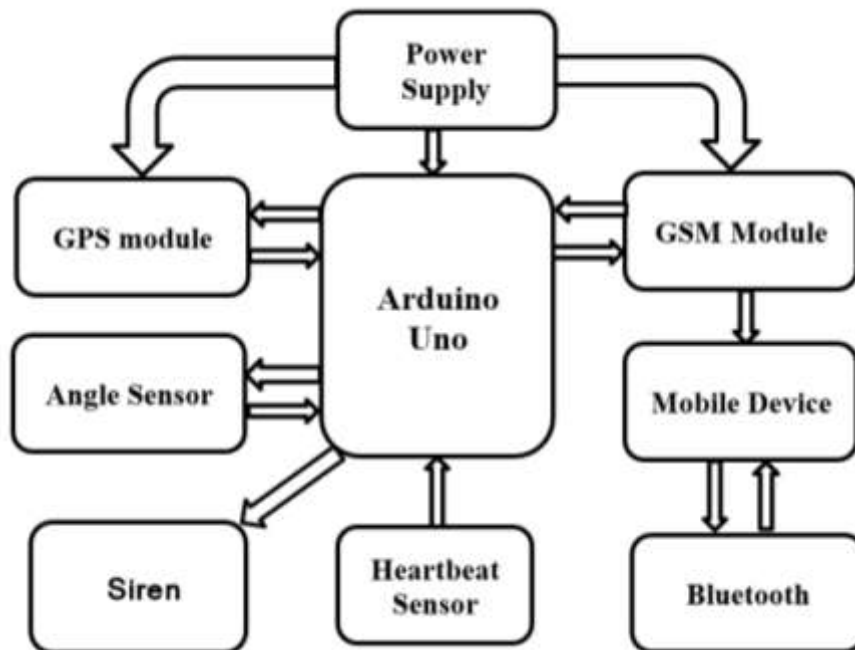
- To ensure everyone's and everything's safety in the workplace.
- Strategies, procedures, and policies aimed at lowering violence against women including women's fear of crime are all part of women's safety.
- To use GPS and GSM to send the victim's whereabouts to the preprogrammed contact numbers.
- To fulfill the objective of giving women protection so they never feel powerless.

### 3. Methodology

#### 3.1. Flow Chart



### 3.2 Block diagram



The above block diagram contains various sensors that are used for sensing the various parameters. It mainly deals with four modules and each module does a work which is predefined. It primarily focuses on four modules, each of which completes a predetermined task. Our system's main goals are to increase women's safety and shield girls from dangerous situations. The heartbeat sensor, Arduino, Bluetooth module, mobile device, and bend sensor make up the majority of the system.

In an emergency, a woman's heart rate will automatically rise. a sensor will detect the heartbeat and the Arduino receives this data. The predefined level in Arduino is used to identify emergency situations. The device will recognize that the girl is in an emergency if the data from the heartbeat sensor exceeds a preset threshold. If the data from heartbeat sensor goes above the predetermined level then the system will detect that the girl is in emergency situation.

The bend sensor is the additional requirement for detection. The girl's body has this sensor a fixed to it. In an emergency, a sensor will detect the angle's bend and send the data to an Arduino. The Arduino will make a call, send a message, and transmit the registered mobile number the real position if the data changes beyond or below the predetermined threshold.

## 4. Component Required:

### 4.1 Arduino UNO –



Fig (1). Arduino UNO

The open-source electronics platform Arduino is built on user-friendly hardware and software. Arduino boards have the ability to take inputs, such as a light from a sensor, a finger pressing a button, or a message from Twitter, and convert them into outputs, such as starting a motor, turning on an LED, or posting content to the internet.

#### 4.2 Heartbeat Sensor –



Fig (2). Heartbeat Sensor

The parents today believe that their daughter is not safe in this generation, therefore even if the job is favorable to them, they will not let their daughter to work night shifts. The problem of the abundance of qualified candidates stops her advancement.

Using a heartbeat sensor as a stimulus for a virtual reality system, researchers may easily measure the heart's function using the psycho-physiological signal theory. Over time, the quantity of blood in the finger varies. Since the sensor is based on infrared molding in silicon, the heartbeat will not be missed after the finger is placed. A heart-rate sensor is assembled with the aid of an OP-AMP to monitor the pulses of the heartbeat in order to determine the heart rate based on the blood flow to the fingertip. An easy-to-use heart-rate sensor for Arduino and Arduino compatibles is the Thumb Sensor Amped. Students, makers, athletes, artists, and game & mobile developers that wish to quickly integrate.

#### 4.3 HC-05 Bluetooth Module –

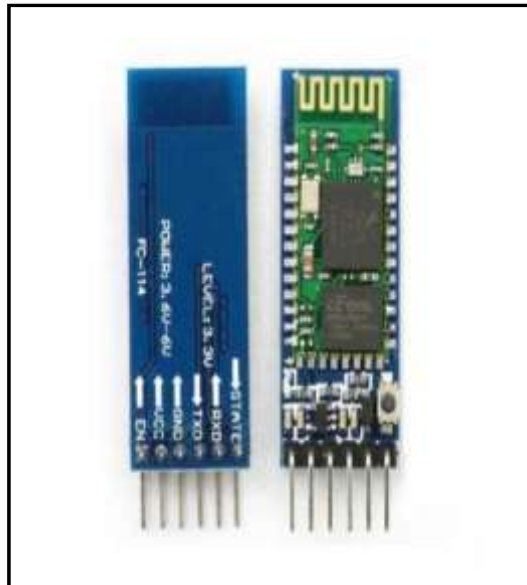


Fig (3). HC-05 Bluetooth Module

Numerous consumer applications, including wireless headsets, game controllers, mice, keyboards, and many more, make use of it. Depending on the transmitter and receiver, atmosphere, geographic location, and urban settings, its range can reach less than 100 meters. A Bluetooth module called HC-05 is intended for wireless communication. It is possible to use this module as a slave or master configuration. The red LED on the HC-05 shows the connection status, indicating whether Bluetooth is active or inactive. This red LED continually and periodically blinks before being connected to the HC-05 module. Its blinking slows down to two seconds when it connects to any other Bluetooth devices. On 3.3 V, this module operates. Since the module contains a 5 to 3.3 V on board, we may also connect a 5V supply voltage.

#### 4.4 GSM Module –

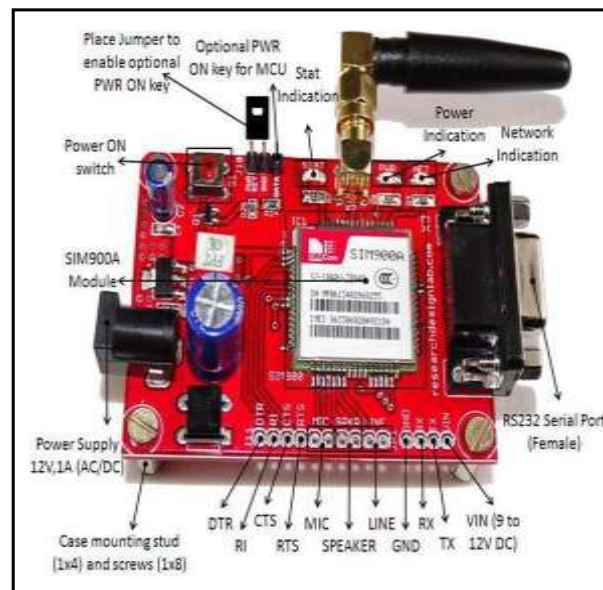


Fig (4). GSM Module

**SIM900A GSM Modem** The SIM900A modem operates on frequencies between 900 and 1800 MHz. It has an RS232 interface that enables you to connect a PC or microcontroller using an RS232 chip (MAX232). You can set the baud rate with an AT command, ranging from 9600 to 115200. The internal TCP/IP stack of the GSM/GPRS modem allows you to establish a GPRS internet connection. It is appropriate for M2M interface applications involving data transfer, voice, and SMS. You can connect a wide range of unregulated power supplies to the onboard regulated power source. With this modem, you may use straightforward AT commands to access the internet, answer incoming calls, send and receive audio calls, and read SMS.

#### 5. Benefits of Project:-

- It is cost-effective and dependable.
- It can be used to prevent incidents.
- It is an all-in-one system. Hence no need to carry multiple devices.
- It can be used by children, teenager girl, women, old lady and old man.
- The System is cost effective.
- It mainly targets to use safety.

#### 6. Conclusion:-

This method serves as the user's unique identification, preventing anyone from setting off a false alarm and guaranteeing that an alert is only sounded in emergency situations. A buzzer is incorporated into the design to guarantee complete security and notify everyone in the vicinity of any incident. Text messaging makes sure that the victim's current position is shared with close family and law enforcement.

#### 7. References: -

- [1] N. Visvanathan, V. Pakyala, and G. Muneeswari, "Smart Foot Device for Women Safety," Institute of Electrical and Electronics Engineers, vol. 16, pp. 130–134, 2016.
- [2] Maithili, A. Helen, and R. Rijwana, "A Smart Watch for Women Security based on IOT Concept Watch Me," Institute of Electrical and Electronics Engineers, number 17, page 190-194, 2017.
- [3] G. Harikiran, K. Menasinkai, and S. Shirol, "Smart Security Solution for Women based on Internet of Things (IOT)," Institute of Electrical and Electronics Engineers, volume 16, page 35513554, 2016.
- [4] A mobile-based women's safety application (I Safe Apps), Dr. Sridhar Mandapati, Sravya Pamidi, and Sriharitha Ambati, IOSR Journal of Computer Engineering (IOSR-JCE): January–February 2015.

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[5] department of electronics and telecommunication, fr. C. Rodrigues Institute of Technology, Vashi, Navi Mumbai, India, adhura Mahajan, KTV Reddy, and Manita Rajput, "Design and Implementation of a Rescue System for Safety of Women."

[6] Poonam Bhilare, Akshay Mohite, Dhanashri Kamble, Swapnil Makode and Rasika Kahane, "Women Employee Security System using GPS And GSM Based Vehicle Tracking", international journal for research in emerging science and technology, volume- 2, issue-1, january-2015

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