

Women Safety Device

Ms. Vaishnavi Shivaji Kale, Dr. Kishor V. Bhadane, Ms. Dnyaneshwari Sanjay Thosar,

Ms. Shalini Bhausaheb Pawar, Ms. Akshada Ashok Pawar

Department of Electrical Engineering

Amrutvahini College of Engineering, Sangamner, Maharashtra, India

Abstract: *World is moving towards super power, but with this Women safety issue also increase. Women safety is a most important topic. Now a day's woman faces many safety problems. There are many cases arise of sexual harassments, rape. The big question in everyone's mind is "Is women are really safe?" We have presented a solution to address these issues: a women's safety device equipped with GPS technology. This device incorporates a GSM module which enables the sending of an SMS to a pre-defined Emergency contact. If any emergency situation is happened then simply press switch. It can start the device. Once activated, an SMS with the woman's current location will be sent to a designated person, facilitated by both the GSM and GPS functionality. Also, with ESP232 cam video, live streaming is done. with this the device is designed to provide a shock to an assaulter by pressing button and touching the device to the abuser's body, allowing an electric current to pass through. This shock is never causing harm or be fatal, only unconscious the assaulter but rather to provide the woman with an opportunity to escape from the location.*

Keywords: Assaulter, AT mega 328p, ESP232 cam, GPS, GSM, SMS.

I. INTRODUCTION

In India, women's safety is a common issue these days. We cannot say that women are safe in India when we see women's are being raped in Indian cities in the last few years. In the early days, sati system, no remarriage window, devadasi system etc. There were serious problems such as. Although many are no longer popular, new problems are emerging. The situation women face may be different, but it is still as cruel as it was in the early days. They hinder the development of the country and make women feel inferior. India is a country where women are given goddess status. However, the problems they have to face make a difference in this thinking without oppressing the and thinking they are inferior.

We must be aware of these problems and act quickly for the development of our country. Women are often afraid of going home alone. Unfortunately, female citizens of this country are in constant fear. Many times, women are subjected to severe violence but there is no one to help and parents are afraid to send their daughters home alone. Violence is one of the most important problems faced by women in India; It affects a woman or girl throughout her life. as per static data this issue is largest among the world So in this case this tool is very useful to help women get rid of all their major problems. This is what our project needs.

Behind of every 100 of women 53 of working women are not feeling safe. Most of the cases happen in Delhi, Bangalore and Hyderabad compare to other places. Primary goal of proposed system is to provide safety to every woman and protect her life from worst incident. This device definitely provides safety to women.

II. LITERATURE REVIEW

According to the survey in India 53% of working women are not feeling safe. Women is a working night shift (Bangalore 56%, Chennai 28%, Hyderabad 38%, Mumbai 26%) In overall 86% working women in India, Women face hurdles are high in Delhi, Mumbai, Hyderabad, Kolkata and Pune comparatively to other places.

The "Women Safety Device" project currently resides at the intersection of cutting-edge technology. The study of existing literature survey is imperative for context understanding and significance of endeavor. The Literature survey presented in such paper is encompasses pertinent studies and research strive in GPS role in safety, safety device using camera and shock treatment. The summary of various research paper studies is explained below.

2.1 Existing Work:

Women Safety Device with GPS tracking and alerting system

This system's methodology encompasses the comprehensive strategy of Live location tracking technology. It entails examining the techniques employed in tracking and the underlying theories or principles, with the aim of devising a suitable approach that aligns with the proposed model objectives. This includes both the necessary hardware and software components of the model. The process involves extracting the real-time location of women utilizing a GPS module, and subsequently transmitting the extracted location to the relevant parents or authorities through a GSM module. Methodology encompasses the comprehensive strategy of live location tracking technology. It entails examining the techniques employed in tracking and the underlying theories or principles, with the aim of devising a suitable approach that aligns with the proposed model objectives. This includes both the necessary hardware and software components of the model. The process involves extracting the real-time location of women utilizing a GPS module, and subsequently transmitting the extracted location to the relevant parents or Authorities through a GSM module [1]

E-Defence Women Safety Application

This system elaborates on women's safety and security by utilizing an application to send alert messages, display safe locations, and notify authorities. It suggests implementing a technological solution to safeguard women. The project involves an Android-based smartphone that incorporates features to alert and provide location-based information. It enables self-defence and sends SMS alerts when a woman is in danger. Voice recognition is employed when a woman is shouting; it identifies the voice and sends an alert message with GPS location to emergency contacts. Additionally, it includes features like audio recording and can be activated through voice commands or an SOS button. The project aims to address the issue of insufficient evidence in many cases by continuously displaying safe zone locations, offering victim safety tips, and functioning in offline mode [2]

Women Safety Device with heartbeat is monitored

This device is capable of detecting emergency situations and retrieving the current location of a woman. It then transmits this information to emergency contacts through a GSM module. Additionally, it is equipped with a shock-giving circuit designed to deter the attacker, increasing the chances for the woman to escape [3]

Women Safety Device with GPS Tracking And Alerts

This device based on system that ensures the safety of women by monitoring the heartbeat. The heartbeat is monitored from the moment the system is switched on. When the heartbeat is increased beyond the normal range, GSM module sends the current location obtained from GPS module to pre-stored contacts 3 times. With this it include the emergency button also. If the danger button is pressed, then the message having the location coordinates is directly send to the pre-stored contacts 3 times. This device design in the form of wrist band [4]

Smart foot device for women safety

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%. [5]

2.2 Drawback of existing system:

Women's safety devices integrated into shoes may face limitations such as discomfort for prolonged wear, potential malfunction, and limited effectiveness in certain situations. Additionally, social and cultural factors may impact the acceptance and adoption of such devices.

Women's safety apps can be effective, but they may have limitations. Connectivity issues, dependence on smartphone functionality, and false alarms are potential drawbacks. Moreover, reliance on an app assumes that individuals have access to and are comfortable using technology, which may not be the case for everyone. Education and awareness are crucial for maximizing the effectiveness of these safety measures.

Women's safety devices incorporating heart rate calculating watches may have limitations, including accuracy issues in certain conditions, potential false alarms during intense physical activities, and reliance on the wearer to keep the

device functional. Additionally, these devices might not address non-physical threats or emergencies. User privacy concerns and the need for consistent user compliance are other factors that should be considered.

Source and Year	Title	Author	Working	Limitations
IEEE 2016	Women Safety with Smart Foot device	N. Vishwanath and Naga Vaishnavi	The GPS module set in shoes which is wearable and hidden panic button	<ul style="list-style-type: none"> Discomfort when prolonged use. Limited effectiveness in certain situation.
IJSRT 2019	Women Safety Device with GPS & GSM	K N Hemlatha & Likitha	Send GPS location and send alert message.	<ul style="list-style-type: none"> Wait for help take more time No alternative defense unit
IJRTE 2020	Women's wearable safety and security device	J.J. Teresa and S. Chandana	The GPS module set in wrist watch which detect emergency by pulse rate.	<ul style="list-style-type: none"> Size is big No camera
International Journal 2021	E-Defense Women Safety App	Nandini S. and manikandan A.	The mobile app which send emergency message and voice message.	<ul style="list-style-type: none"> May have connectivity issue Education & awareness require
IJCRT 2022	Women Safety Device with GPS	Rajini R. and Chandrashekhar N.	GPS module with shock treatment.	<ul style="list-style-type: none"> Large size Handling issue no evidence arrangement

Table.1 Literature Survey

III. METHODOLOGY

Developing women safety device involves aurdino integrated with GPS, GSM module. All components are integrated with ATmega 328P which is aurdino development platform. These devices send Help message to emergency contact with current location. With help of camera it captures video and live streaming and it also used for evidence purpose. With all this feature this device contain shock device. these shock treatment use to unconscious the attacker and gives time to women escape from that place and searching safe place and with addition to this we use laser light, laser pointer put on attacker's eye can damage its eyesight and women safely escape from that location.

Components used in system are:

- ATmega328p
- GPS module
- GSM 900 A module
- ESP 32 Cam
- Shock Generator
- Push Button

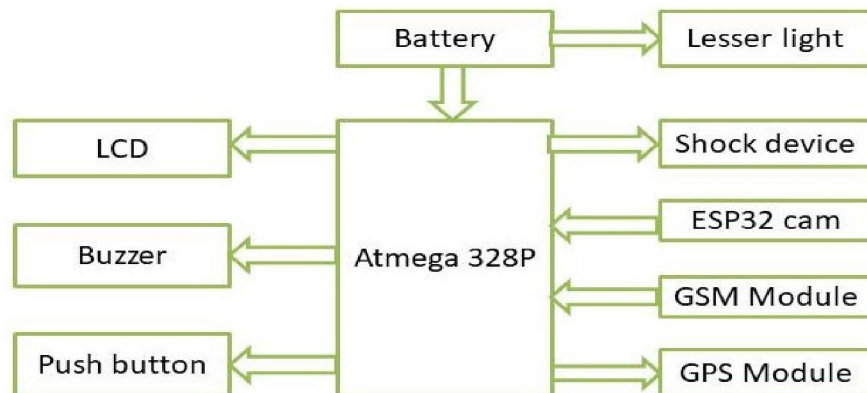


Fig.1. Block Diagram

ATmega 328P:

It is popular Arduino development platform. ATmega 328P is microcontroller with high performance. It has 32KB flash memory with read while write capabilities. SRAM for data storage, EEPROM for non-volatile data. It is an 8 bit microcontroller based on Advance virtual RISC architecture. Having 28 pins it is simple, low powered, low cost. P is stand for Pico power. AT stand for Atmel. Atmel is the company which develops this microcontroller.

GSM 900 module:

It is readily available module use to provide network connectivity to our system. It uses 890 to 915 MHz to send information. It transfers data with speed of 85.6 kbps. It allows electronic device to connect wirelessly to send SMS messages and other functionality. This supports GPRS coding. GSM is the combination of TDMA, FDMA and frequency hopping.

GPS Module:

GPS in women's safety devices refers to Global Positioning System technology. These devices are equipped with GPS technology, allowing them to determine the precise location of the user. In the context of women's safety, these devices integrate with GSM model and ATmega328p. When activated, they can send the user's location information to designated contacts or authorities, enabling a quick response in case of emergencies or dangerous situations. It basically sends longitudinal and latitudinal coordinates of location.

ESP 32 Cam:

An ESP32-CAM module for women's safety is a great idea. You can create a device or a security system with the ESP32-CAM module to enhance women's safety. Here are a few features we can implement:

Live Video Streaming: - Utilize the camera to stream live video to a mobile app, allowing users to monitor their surroundings in real-time.

Motion Detection: - Implement motion detection algorithms to alert the user when suspicious movements are detected.

Shock Device:

This device use for providing shock. This shock is never cause death.it make unconscious to the attacker.

It uses high voltage and low current. Current effect on human body according it's range is as follow:

0-20 mA range: Not cause any significant effect. Not more harmful.

20-50 mA range: can lead to ventricular fabrication.

50-100 mA range: Heart rhythm disturbance. Make unconscious.

100-1000 mA range: Cause respiratory paralysis. May cause death.

Above 1000 mA range: Cause sudden death.

And voltage range and its affect as follow:

Low voltage: (up to 50 Volt AC or 120 Volt DC) is the safer range for human being

Medium voltage: (between 50 and 1000 Volt AC) it can lead serious injury.

High voltage :(above 1000 volt AC) It has significant risk of injury. May cause death.

IV. PERFORMANCE ANALYSIS

Our proposed system includes ATmega 328p which perform as main functional unit. It integrates all devices. Receive signal and respond according it.

Performance of ATmega 328p and Analysis:

In our proposed system, an ATmega 328p microcontroller can be used to manage various functions and sensors ensuring the safety of the women. Here's a general overview of how ATmega can work in such a system

- Sensor Integration: ATmega 328p can interface with sensors such as GPS, shock generator, ESP 32 camera, Laser light and panic button.
- Data Processing: The microcontroller processes data from sensors, analysing the user's situation.

- **Communication:** ATmega can establish communication with a GSM module or other wireless technologies like Bluetooth or Wi-Fi.
- **User Interface:** ATmega can control LEDs, displays, or sound modules to provide feedback to the user.
- **Power Management:** The microcontroller can manage power resources efficiently, ensuring the device operates optimally on battery power.

Performance and Analysis of GSM module:

Generally, GSM technology allows for reliable voice calls and text messages, making it suitable for emergency communication devices.

- **Network Coverage:** The device’s effectiveness relies on the availability and strength of GSM network signals in the area of use.
- **Battery Life:** ensuring it remains operational during emergencies. It optimizes power consumption.
- **Location Accuracy:** Some GSM-based devices can provide location information accurately.
- **Response Time:** When the device is activated, the response time, including the time taken to establish a connection and transmit data is critical in emergency situations.
- **Integration with Support Services:** The device should seamlessly integrate with emergency services, allowing for swift response and assistance.

Performance of Shock Device:

Shock device is main focus of proposed system. It performs effective delivery of previously set constant current shock.

- **Adjustable Range:** The shock intensity is adjustable within suitable range. The current range is set about 50-60 mA, voltage range is vary from 0 to 5 kv and 50 Hz frequency.
- **Customizable Intensity:** These system offer adjustable shock intensity. It allow user to set it at level they find comfortable for self-defence.
- **Personal Empowerment:** In Emergency situation where women are under direct threat and there is no other option for escape, this device could provide a mean to allow victim to escape and seek help.
- **Safety:** This device is properly insulated which never cause harm to user. the proper care of safely handling is taken in consideration.

Sr. No.	Current range	Effect
1	0-20 mA	Not cause any significant effect
2	20-50 mA	Can lead ventricular fabrication
3	50-100 ma	Make Unconscious.
4	100-1000 mA	May cause death.
5	Above 1000 mA	Cause sudden death.

Table 2. Effect of current based on range

Performance analysis of Camera and Laser

ESP32 Cam:

- **Connectivity:** Connectivity: This camera is equipped with a Wi-Fi connection that provides stable and secure connectivity, ensuring reliable data transmission.

- **Power Efficiency:** It is worth noting that this camera module is power-efficient, consuming less power and thereby increasing the performance of the battery, allowing for extended usage without the need for frequent recharging.
- **Real time streaming:** This device has ability of live video streaming and fed it to real time streaming.
- **Data Handling:** This store the data which further used as evidence purpose

Laser:

- **Safety:** This is non-lethal and safe for both victim and attacker. this design accordance with to prevent accidental activation.

Message sending system Analysis:

This system include program for designed for sending emergency messages in a manner that entails transmitting assistant help request and also send GPS coordinates to predefined numbers i.e. Emergency contact.

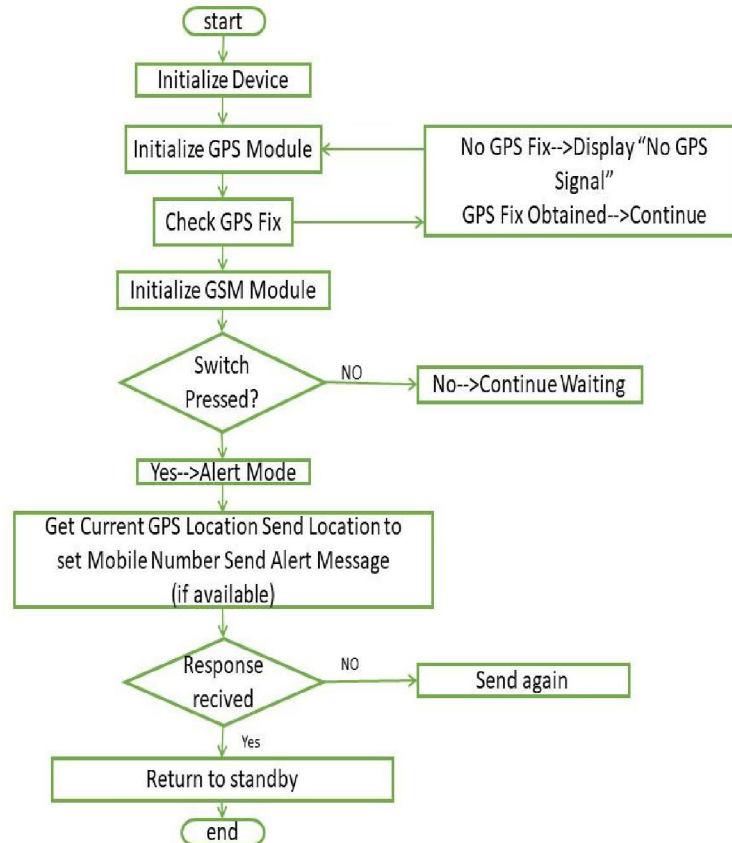


Fig.2. Flowchart of Message sending system

When we start device it first initialize GPS module and check for GPS is fix or not. It Essential GPs fix, if GPS not fix then it shows “No GPS Signal” and again initialize the GPS module. To fix GPS, ON and OFF it or restart it. After GPS fix, GSM is initialize. This Process is work when model is firstly activated, activated power mode on. This setting not require all time. It simply work in such way that as switch is pressed, system detect that alert mode and send Alert/Help message and GPS location to contact numbers which save as emergency number in such system. The main feature which makes system more effective is that proposed system send message till message received is not confirm. If message receive is not confirm it send alert message again and again till confirmation by receiver is not done.when message receive by emergency contact is confirm they send confirmation message to proposed system and then it stop the sending message

V. CONCLUSION

The proposed system focuses primarily on the improvement of women's safety and the provision of self-defence measures. The system having integration of GSM, Shock device and camera. The GSM module sends the current location obtained from GPS module to pre-stored emergency contacts and the shock-generator device designed to unconscious the attacker, which provides the chances for the woman to escape. Using camera video streaming is done. Which further use as evidence purpose. With the successful implementation of proposed system of women safety device, the main aim to facilitate prompt assistance for women in danger, thereby minimizing the threat they may face. By equipping women with effective defence mechanisms, aim to empower them to handle potential threats until help arrives. Our ultimate objective making this device with compact size and affordable entails utilizing technology to effectively tackle the substantial societal matter that women encounter and facilitate them with improved safety and defence capabilities.

VI. ACKNOWLEDGMENT

We would like to express our sincere gratitude to all those who have contributed to the successful completion of the Women Safety Devices Project. We are also indebted to our team members whose dedication and hard work made this project possible. Our innovative ideas and tireless efforts have resulted in the creation of devices that prioritize women's safety. We appreciate the support and guidance provided by our mentors and advisors throughout the project. Your expertise has been instrumental in steering our efforts in the right direction. Thank you all for your contributions and support

REFERENCES

- [1] "Women Safety Device with GPS tracking and alerting system" by Dechamma A K, Swathi, Chaithali, Harshitha K, Prof. Yogesh N, IJCRT ISSN: 2320-2882 Volume 10, Issue 7, July 2022
- [2] "E-Defence Women Safety Application" by Saranya K, Nandhini S, Adish C B, Manikandan A International Journal on Advanced Science Engineering and Information Technology, April 2021
- [3] "Women Safety Device", Rajini R, Chandrashekhar N, Shivakumar G, Shivshankar H., Shivakumar S, JETIR ISSN: 2349-5162 Volume 6 Issue 5, May 2019
- [4] "Women Safety Device With GPS Tracking And Alerts", Riddhi Shah, Miloni Ganatra, International Journal of Creative Research Thoughts (IJCRT), ISSN: 2320-2882, Volume 6, Issue 2, April 2018.
- [5] N. Viswanath 2016 Smart foot device for women safety by N. Viswanath, Naga Vaishnavi Pakyala, G. Muneeswari 2016 IEEE Region 10 Symposium (TENSYP) 40 citations
- [6] Nishant Bhardwaj and Nitish Aggarwal for Design and Development of "Suraksha"-A Women Safety Device, 8 Number 2014
- [7] ShaikMazharHussain for Women Security System, 3 March 2014
- [8] "Women Safety Device using GPS and GSM Modem" by Likhitha K N, Hemalatha K N, International journal of Innovative Science and Research Technology, Volume 4, Issue 6, June 2019
- [9] "Women's Wearable Security and Safety Device", S K Anisha, S. Chandana, J.J. Teresa, S. Varma, M N Thippeswamy, International Journal of Recent Technology and Engineering (IJRTE), ISSN: 2277-3878, Volume 9 Issue – 4, November 2020
- [10] www.ijcrt.com
- [11] www.jetir.org
- [12] <https://jetir.org/papers/JETIR2105532.pdf>
- [13] <https://www.hongkiat.com/blog/android-personal-safety-women-apps/>
- [14] <https://www.gsmfavorites.com/documents/sms/faq/>
- [15] <https://www.arduino.cc/en/Guide/ArduinoNano>
- [16] <http://www.electronicwings.com/arduino/gps-module-interfacing-with-arduino-uno>
- [17] "Power Electronics" by M D Singh and K B Khanchandani.
- [18] "Linear Integrated Circuits" by D Roy Choudhry & Shail Jain