# Design of Disha Device for Women Safety

**M.Hima Bindu, Megha Dangi, Katta Karthik Reddy, R.V.N Sai Sravani, E. Pushadapu Navya Sri**

**Abstract**—India is an emerging superpower but the crime rates against women have only increased to a greater extent. Whilst the conventional method to women's protection are based totally on restrictions, fear and self-maintenance, a paradigm shift primarily based on women's right to an existence that is free from fear and violence is important. In this paper, the author has designed a portable, smart device which facilitates the women in distress to protect themselves with just one press. With features such as in-built live location tracking, audio/video recording, automatic message sending to pre-set emergency contacts, buzzer, flash light and pepper spray, the Disha Device is one solution security system that provides women self-defense and enables them to escape in critical circumstances.

**Index Terms**— Arduino, GPS and GSM modules, self-defense, Women safety

## I. INTRODUCTION

Women is a symbol of love, purity, knowledge, and sacrifice. Later, because of social, political changes, women lost their status and were relegated to the background and are very much prone to crimes against them nowadays. According to Criminal Law Journal, 80 and 75 percentage of cases have been reported and increased in High Courts and Supreme Courts, where there is always delay in the process of prosecution. We have to create a self-protection awareness where women can protect themselves at the time of distress. Rural or urban areas, developed or developing countries – women are vulnerable to sexual assault, fear and various acts of abuse. This hinders their freedom to travel about freely and limits their access to vital services [1]. They have the right to be protected from violence, intimidation, or discrimination. Through eliminating obstacles of an unsafe environment, women can utilize their absolute potential in contributing to work and the country. As per the 2020 US report, India is not the ideal nation for women safety. It ranks fifty-eight in the list of ideal countries for women safety, with one spot falling

from the 2019 ranking [2]. According to the 2019 Neta App survey, about 42 percent of women feel unsafe in the surroundings, 78 percent of them feel that there are not enough measures taken to ensure women safety and 43 percent of the women revealed that they have been confronted with an incident where their safety was undermined [3]. A survey by YouGov reported that about 29 percent of urban Indians feel that the priority of the country in the year 2020 should be on women safety [4]. However, if India is not the worst nation in terms of women safety, a lot can certainly be done to ensure that women feel secure inside or outside their house [5]. While we have cities with all-women patrolling teams, apps to aid in trouble and helplines, women cannot always rely on smart phones. This creates a need for a device which is portable, convenient, inexpensive and which is unidentified by the strangers. The Disha Device is thus a boon for women with which they may defend themselves in any situation of distress.
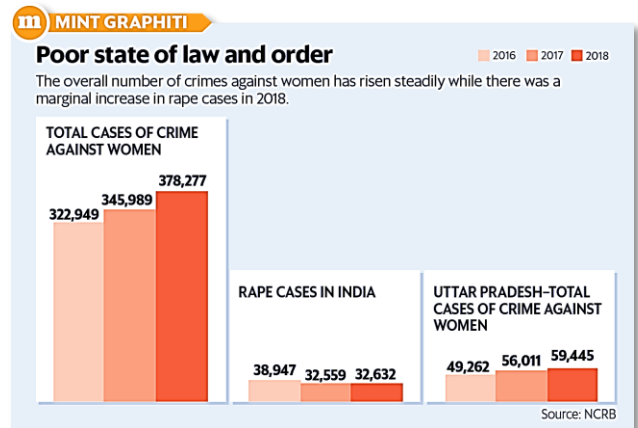


Fig. 1. Rate of increasing crime against women

## II. EXISTING SOLUTIONS

Many of the existing safety measures applicable for women safety use smartphones. Advanced electronic system for human safety (AESHS) tracks the victim's location via mobile phone. Another system, Society harnessing equipment (SHE) delivers a strong electrical shock to the attacker. An emergency app, VithU, sends warnings to the set contacts when the power button of your smartphone is pressed twice in a row. The author in [6] proposed a system for women safety in which the woman's location could be tracked by simply pressing the switch and then sending it to the pre-set contacts through GSM. The device also included a shock mechanism and a buzzer.

The work in paper [7] consists of an ARM controller for hardware device. It proposed to use RF signal detector to detect hidden cameras. It is a one-click system and Bluetooth

*International Journal of Research in Advent Technology, Vol.8, No.7, July 2020*
*E-ISSN: 2321-9637*
*Available online at www.ijrat.org*

is used on both app and mobile. The system can also record audio, send notifications and an instant location to the contacts in every two minutes. The author in paper [8] suggested a system in which once the device is turned on, the location of the victim is tracked using GPS and a message is sent to the registered contacts and the police control room via GSM. This also has a screaming alarm with a real time clock and gives an electric shock to the assaulter. The work [9] proposes a smart band which communicates with the smart phone that has access to the web. The device comprises of an IoT module, GSM, GPS, vibrating sensor, buzzer and neuro-stimulator. It continually tracks the location and it gets constantly updated to the webpage.

The author in paper [10] proposed an android application which tracks the location and it is sent to the pre-set contacts. The system is implemented in such a way that when the volume button is pressed once, then it sends a message alert; if it is pressed twice, then the audio and if it is pressed thrice, then the police is notified.

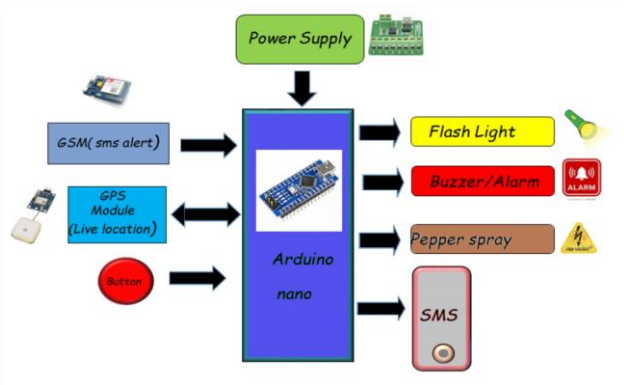## III. PROPOSED SYSTEM AND METHODOLOGY



Fig. 2. Block Diagram of proposed device

The designed system consists of the following features:
1. Alarm/Buzzer when in distress.
2. In built live location tracking.
3. Audio/video recording & sending them to preset contacts.
4. Automatic message sending of live location & Information to the preset emergency contacts.
5. Flashlight

Pepper sprayed on the stranger when attacked.

The designed system consists of the following components:

### A. Hardware components
- *Arduino Nano:* It is a microcontroller board based on the ATmega328. The compact size and flexibility render it ideal for a wide range of applications.
- *Global Positioning System Module (GPS):* The GSM enables the live location tracking. The current location is monitored in the form of latitude and longitude which can be used to provide time and location-based information.
- *Global System for Mobile Communication Module:* The GSM module is used to set up a system of communication which enables sending and receiving messages. Upon tracking the current location through GPS, the GSM module can be used to send an alert to the pre-set contacts.
- *Multi Power Supply:* It is an electrical device that supplies power to the circuit.
- *Pepper spray:* The provision of pepper spray is for the woman's self-defence. Women can use it to distract the attackers which gives them a chance to escape from the critical situation and take necessary action.
- *Light (10mm LED):* The usage of a flashlight is another self-defence tactic which is used to divert the focus of the assaulter.
- *Buzzer:* A buzzer is an audio signaling device that can be directly connected to the Arduino. The buzzer acts as an alarm that can be used to alert people in the vicinity.

### B. Software components:
- *Arduino IDE:* The Arduino Nano is programmed using the Arduino IDE, the integrated development environment which is common to all the boards.

These components therefore provide an integrated, one-click system devised for women safety. When the button is pressed, an alarm rings to alert the people around, the pepper is sprayed on the attacker, a message alert with the location and image of the attacker is sent to the pre-set contacts and the flash light turns on to divert the attacker.
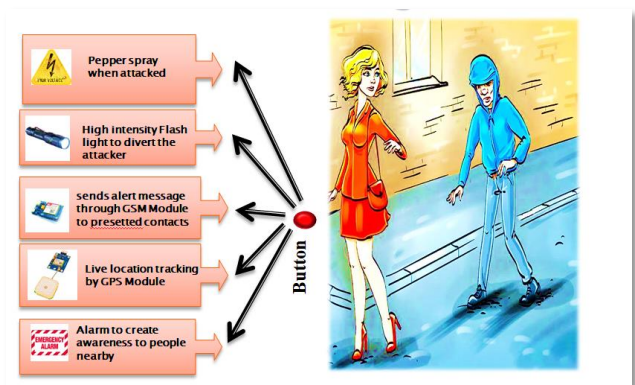


Fig. 3. Working features of the proposed device

## IV. RESULTS AND DISCUSSION

Fig. 4 represents the framework and Fig. 5 represents the prototype of the proposed design. This new women's device that would not only produce an emergency alert but also send a alert message to your friends , family or the individual concerned. Here we have a system that can be used by

*International Journal of Research in Advent Technology, Vol.8, No.7, July 2020*
*E-ISSN: 2321-9637*
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women using SOS emergency SMS along with the current location to notify police or others. The police will be able to save the victim from the place using this information. Here we used an Arduino that can be interfaced with GSM and GPS module Send SMS alerts and get coordinates for the location. For wireless communication between the band and receiving system with GPS / GSM, we also used an RF Transmitter and receiver module. The GPS specifies the location through latitude and longitude, and the GSM module guides SMS to the contacts that have been pre-set. The device component that sends messages through GSM is checked.
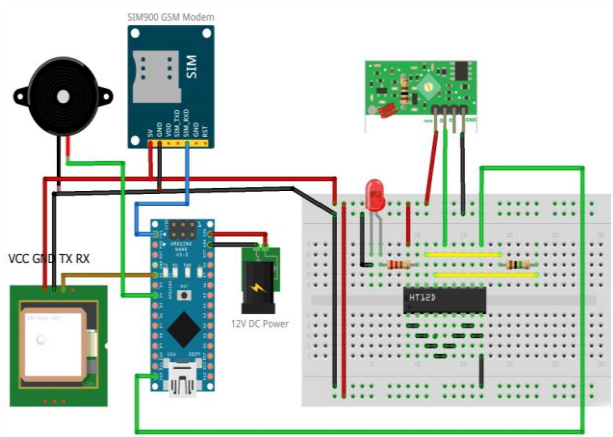


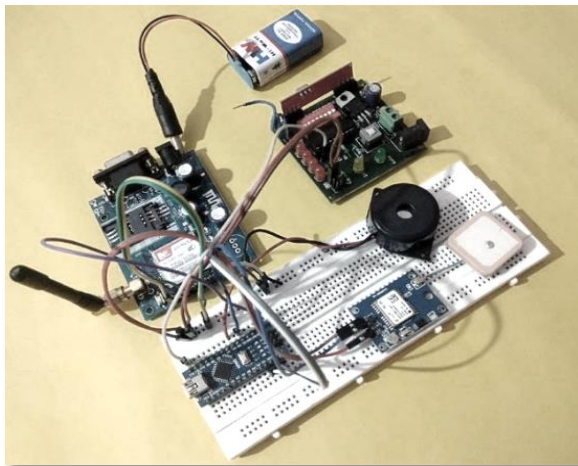Fig. 4. Framework of the proposed design



Fig. 5. Prototype of the proposed design

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**M.H Bindu Reddy** working as an Assistant professor in the department of Electronics and Communication Engineering (ECE) at Hyderabad Institute of Technology and Management and currently pursuing Ph.D from GITAM University in the area of Internet of Things. She has co-authored five journal publications till date. Her research interest includes Internet of Things and Wireless sensor networks, Engineering Education. She has worked on various projects, sensors and actuators using Arduino, NodeMCU, She is a trainer at Student Skill Development Center (SSDC), a center for excellence in IoT, since 2019. Raspberry pi. She is now working on IoT platform.

## V. CONCLUSION

The Disha Device is a one-click, compact and portable system that is designed to address the need of a safe and secure environment for women. As the usage of applications on smart phones may not always be the ideal solution, the proposed device comes as an aid. It not only provides them a security system but also makes them self-reliant by providing a self-defense mechanism to ensure women safety in any critical circumstance

## ACKNOWLEDGMENT

## REFERENCES

[1] G. C. Harikiran, K. Menasinkai and S. Shirol, "Smart security solution for women based on Internet Of Things(IOT)," 2016 International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT), Chennai, 2016, pp. 3551-3554, doi:10.1109/ICEEOT.2016.7755365.

[2] (The Logical Indian, Survey. Available: https://thelogicalindian.com/news/us-survey-women-safety-19341

[3] Your story, 2019. Available: https://yourstory.com/herstory/2019/12/india-women-safety-rape-hyderabad-voices

[4] Your Story, 2020, YouGov survey. Available: https://yourstory.com/herstory/2019/12/indian-women-safety-focus-area-2020-yougov-survey

[5] T. M. R, Aishwarya, C. K. S, D. M. K and N. H, "IoT Based Smart Security Gadget for Women's Safety," 2019 1st International Conference on Advances in Information Technology (ICAIT), Chikmagalur, India, 2019, pp. 348-352, doi: 10.1109/ICAIT47043.2019.8987242.

[6] Dr. AntoBennet, M "A Novel Effective Refined Histogram For Supervised Texure Classification", International Journal of Computer & Modern Technology , Issue 01 ,Volume02 ,pp 67-73, June 2015.

[7] Monisha, D. & Monisha, M. & Gunasekaran, Pavithra & Radhakrishnan, Dr.Subhashini. (2016). Women safety device and application-FEMME. Indian Journal of Science and Technology. 9. 10.17485/ijst/2016/v9i10/88898.

[8] AntoBennet, M &JacobRaglend, "Performance Analysis Of Filtering Schedule Using Deblocking Filter For The Reduction Of Block Artifacts From MPEQ Compressed Document Images", Journal of Computer Science, vol. 8, no. 9, pp. 1447-1454, 2012.

[9] Design and Implementation of Women Safety System Based On Iot Technology by B. Sathyasri, U. Jaishree Vidhya, G. V. K. Jothi Sree, T. Pratheeba, K. Ragapriya, International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-7 Issue-6S3 April, 2019.

[10] D.G. Monisha, M. Monisha, G. Pavithra and R. Subhashini, "Women Safety Device and Application-FEMME", Indian Journal of Science and Technology, Vol9 (10), March 2016.

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