



# ARDUINO BASED SELF DEFENCE SYSTEM FOR WOMEN SAFETY PROTECTION

<sup>1</sup> Komari Ankitha, <sup>2</sup> Dr.J.Amarendra, <sup>3</sup> C. Suneetha

<sup>1</sup>M. tech Scholar, Dept. Of ECE, Audisankara College of Engineering and Technology, Gudur, Andhra Pradesh

<sup>2</sup> Associate Professor, Dept. Of ECE, Audisankara College of Engineering and Technology, Gudur, Andhra Pradesh

<sup>3</sup> Associate Professor, Dept. Of ECE, Audisankara College of Engineering and Technology, Gudur, Andhra Pradesh

## ABSTRACT:

Due to the rise in crimes against women, women's safety is increasingly important. To help resolve this issue we propose a GPS based women's safety system that has dual security feature. The proposed system consists of a dual alerts that is buzzer and message is sent through GSM. This system can be turned on by a woman in case she even thinks she would be in trouble. A GPS and GSM modem-based safety detection system for women is presented in this project. The system can be interconnected with the alarm system and alert the neighbours. This detection and messaging system is composed of a GPS receiver, GPS Receiver gets the location information from satellites in the form of latitude and longitude. The user receives the information from GSM which receives the processed information from the Microcontroller. The Arduino UNO is connected to a GSM modem. The predetermined mobile number receives an SMS from the GSM modem. If a woman is in danger and needs to defend herself, she can press the switch that has been assigned to her. By pressing the switch, the entire system will be activated then immediately a SMS will be sent to concern person with location using GSM and GPS.

## I.INTRODUCTION:

Women safety has always been an issue even in these modern times with so much advancement in technology. Women are not safe anywhere and are most vulnerable when traveling alone into lonely roads and deserted places. Women must activate the existing handheld devices for women's safety by sensing a danger and either pressing the button or

shaking the device, among other actions. However, the purpose of the safety device is not fulfilled for some reason if a woman is in danger but does not have time to activate it. Women's safety is seen as one of the most pressing concerns in a nation like India, where the rate of crime, including robberies, homicides, rapes, and many more, is thought to be higher than the rate of population growth. India has the highest number of child brides and is ranked as one of the most dangerous places for women worldwide, according to a Thomson Reuters Foundation report. In 2016, the number of reported rapes is almost 39,000. Experts that were interviewed for the reason why India is presumed to be dangerous for women said India is on top of the list because its government has done almost nothing to provide safety to women since the rape and murder of a student in early 20's in 2012 which prompted changes in the rape laws of the country. Most of the attacks on women happen when they are traveling alone or are in a remote area where they are not able to find any help or proper assistance. This paper proposes aIoT based solution to address the problem of women safety and that overcome the shortcomings of existing devices. The proposed design comprises of features to notify family members and nearby police station for immediate assistance when women are not safe. Moreover, a shock wave generator is a part of the proposed design which women can use to attack the perpetrator. Some of the other features in the proposed work that provide additional support to women are as follows:

1. Sending group messages from the device as well as from the victims' phone.

2. Recording audio of the victim which may be later used as proof against the perpetrator.

3. Locating safe place from victim's current location on the map.

## II.LITERATURE SURVEY:

Suraksha[2] is an independent device that can be triggered by voice, switch, or shock or force. Voice is the victim's voice. The device will recognize it and automatically send distress messages. Switch is a simple on/off trigger, and shock/force- whenever this device is thrown it will use force sensor to start functioning by giving the information of the location of the victim to her members of family and friends. Poonam et al. [5] developed a safety device that uses an ATmega 328 microcontroller without any android application which makes it a stand-alone device. It uses GPS and GSM modules to track the location and then send it to the family members and friend, alerting them about the current location of the woman A self-defence women safety system [7] is proposed which when triggered by a switch, automatically sends the location of the victim to their concerned one. In addition, the device will also play a prerecorded message using speech circuit to alert the surroundings. The authors' device (FEMME) [4] includes an Android application. Its basic functionality is to send an SOS message, record audio and video of the whole incident as evidence. It also has a module that uses a radio frequency receiver to find hidden cameras and collects and detects electromagnetic waves from the spy camera. Kumar et al. [3] have proposed a device which is in a form of a wristwatch and works on the concept of GEOFENCE, which is a virtual boundary that triggers the application when the person is in a particular area. It also has the feature of two-way talk so that the victim may be able to contact her family or friends. The device also allows the woman to trigger a loud buzzer on the receiving side of the message even if their device is in silent mode. SMARISA [6] is a portable device for women safety. It comprises of hardware components such as Raspberry Pi Zero, Raspberry Pi camera, buzzer and button to activate the services. It is activated by the victim by clicking the button. The victim's current location is retrieved upon clicking, and the attacker's image is captured by the camera. The victim's smart phone then sends the image to the police or predetermined emergency contact numbers.

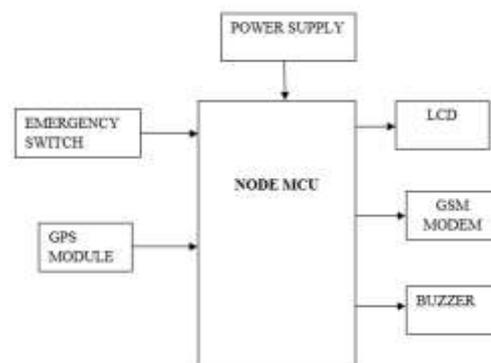
## III.EXISTING SYSTEM:

Another existing method is an application based prototype. It is interfaced with GPS, GSM and a spy camera. The user must register the emergency numbers. This is an android app which provides all facilities but it has a disadvantage that if the mobile phone of the victim is thrown away by the opposing person, this model cannot be used efficiently. To overcome these disadvantages we propose a model.

## IV..PROPOSED SYSTEM:

The whole system uses GPS and GSM modems, electric shock circuit and Arduino microcontroller board. GPS receiver works as the detector, it fetches the location of the concerned accident in the form of latitude and longitude. GSM sends the latitude and longitude information as a SMS to predefined numbers with the help of programmed microcontroller. It also sends a phone call to one phone number. Microcontroller works as the backbone of the system. Whole system can be activated by just a single press of panic button.

## V.BLOCK DIAGRAM:



## VI.HARDWARE DESCRIPTION:

### A.Node MCU ESP8266 V3 (LOLIN CH340 chip)

The key to unlocking the Internet of Things (IoT) potential is the Lolin NodeMCU ESP8266 V3 WiFi Module. If you're looking for an IoT development solution that works seamlessly and is affordable in India, you've found it. This versatile NodeMCU V3 module brings IoT innovation to your fingertips, and you can conveniently purchase it online at the best price. Our NodeMCU V3 module is made to meet all of your IoT requirements. Equipped with a built-in Micro-USB interface, CH340 USB-TTL converter,

and full I/O support, this module simplifies IoT development. It's compatible with the Arduino platform, making it a favorite among developers.

Simplifying IoT product prototyping, the NodeMCU ESP8266 V3 supports Lua scripting, GPIO (General Purpose Input/Output), PWM (Pulse Width Modulation), IIC (Inter-Integrated Circuit), 1-Wire, and ADC (Analog-to-Digital Converter) all in one board.



Fig 1:NODE MCU

### B.GSM MODULE:

The SIM900A is a readily available GSM/GPRS module, used in many mobile phones and PDA. The module can also be used to create embedded applications and IOT (Internet of Things). SIM900A is a dual-band GSM/GPRS engine that works on frequencies EGSM 900MHz and DCS 1800MHz. SIM900A features GPRS multi-slot class 10/ class 8 (optional) and supports the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4.



Fig 2:GSM module

### C.GPS MODULE:

The NEO-6MV2 is a GPS (Global Positioning System) module and is used for navigation. The module only checks where it is on the planet and gives out its position's longitude and latitude as output. It is part of a family of stand-alone GPS receivers with the powerful u-blox 6 positioning engine. These flexible and cost effective receivers offer numerous

connectivity options in a miniature (16 x 12.2 x 2.4 mm) package. The compact architecture, power and memory options make NEO-6 modules ideal for battery operated mobile devices with very strict cost and space constraints. NEO-6MV2's cutting-edge design ensures that it can navigate even the most difficult environments with ease.

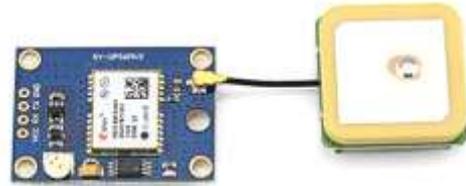


Fig 3:GPS Reciver

### VII.RESULTS:



Fig 4:Hardware implementation

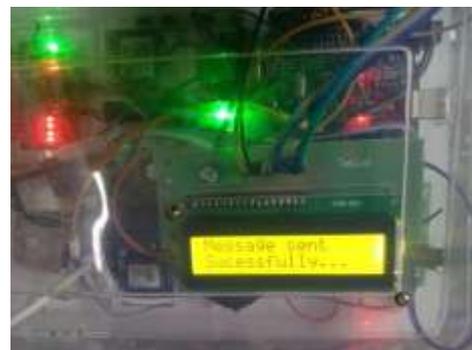


Fig 5:Sending message



Fig 6:Message received when person is in danger



Fig 8:Updated in webpage

## VIII.CONCLUSION:

The paper mainly focuses on the low cost implementation of the device which can save the life of the women in the critical condition the proposed system provides end to end security solutions for women safety using the advance technologies of IoT along with combined hardware technology like Arduino UNO . The proposed system not only defends the women in the critical situation of rape, molestation but also the captured image of the culprit is used as a valid proof that can be presented in the Indian Judicial Courts for making the culprit guilty for his committed crime. The overall system is first of its kind that provides a complete kit solution to the existing women safety problem, with the complete system the women can now travel freely without any hesitations of getting harmed by the societal issues. The prototype of our system can be turned into a consumer-useable portable product by conducting additional research.

## REFERENCES:

- [1] Ahir, S., Kapadia, S., Chauhan, J., & Sanghavi, N. (2018, January). The Personal Stun-A Smart Device For Women's Safety. In 2018 International Conference on Smart City and Emerging Technology (ICSCET) (pp. 1-3). IEEE.
- [2] Bhardwaj, N., & Aggarwal, N. (2014). Design and Development of "Suraksha"-A Women Safety Device. International Journal of Information & Computational Technology, 4(8), 787-792.
- [3] Kumar, N. V., & Vahini, S. (2017). EFFICIENT TRACKING FOR WOMEN SAFETY AND SECURITY USING IOT. International Journal of Advanced Research in Computer Science, 8(9).
- [4] Monisha, D. G., Monisha, M., Pavithra, G., & Subhashini, R. (2016). Women safety device and application-FEMME. Indian Journal of Science and Technology, 9(10).
- [5] Poonam Bhilare, Akshay Mohite, Dhanashri Kamble, Swapnil Makode and Rasika Kahane, "Women Employee Security System using GPS And GSM Based Vehicle Tracking", Department of Computer Engineering Vishwakarma IOT Savitribai Phule Pune University India, E-ISSN:-2349- 7610 INTERNATIONAL JOURNAL FOR RESEARCH IN EMERGING SCIENCE AND TECHNOLOGY, Volume-2, ISSUE-1, JAN-2015.
- [6] Sogi, N. R., Chatterjee, P., Nethra, U., & Suma, V. (2018, July). SMARISA: A Raspberry Pi Based Smart Ring for Women Safety Using IoT. In 2018 International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 451-454). IEEE.
- [7] Vijaylaxmi, B., Renuka, S., Chennur, P., & Patil, S. (2015). Self defense system for women safety with location tracking and SMS alerting through GSM network. International Journal of Research in Engineering and Technology (IJRET), 4(5).