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Women Safety Device using GPS and GSM Modem

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Abstract:- The challenging problem faced by the women in the modern world is their security. They do not have complete independence and security in their everyday life. They are made to lead their life in constant fear. Many steps have been taken in the field of women security, but these could not help us from reducing the number of assault against women. There are many laws and regulations against this issue. But something has to be done at grass roots level. This project aims to solve this issue with the help of technology. The main objective is to provide an alert and safety system for women. This system contains an integrated SOS button. When the user activates this button, an SMS is sent to the preset mobile number with accurate location data. This data can be used to track down the victim when she reaches out for help. Further, the system contains an LED mechanism that can be flashed by the victim in case of an assault. This LED, when flashed from a sufficient distance can blind the attacker for approx. 5 seconds. This provides an escape window for the victim. This system ensures safety and flexibility for women.

Keywords:- *Security; Assault; SOS Button; LED Mechanism.*

I. INTRODUCTION

A. Objective

Security is the most important aspect in one`s life .It is being protected from danger or loss. In general sense, security is a concept similar to safety. The difference between the two is an added emphasis on being protected from dangers that appear from outside. Individuals or actions that bring threat to the security stand guilty in front of the law. The word "security" in general usage is synonymous with "safety," but as a technical term "security "means that something not only is secure but that it has been secured.

The proposed design presents women safety detection and alerting system using GPS and GSM modules. The system further contains a self defense tool in the form of an LED mechanism. This detection and sending the information actions are composed of a GPS receiver, Microcontroller and a GSM Modem.

GPS Receiver gets the information of the accurate location from satellites around the earth in the form of latitude and longitude .It needs minimum of four satellites to get the accurate location.

The Microcontroller processes this information and this processed information is sent to the user using GSM modem using AT commands. A GSM modem is interfaced to the MCU. The GSM modem sends an SMS to the predefined set of mobile numbers. When there`s a threat to women security and she is in need of self defense she can use this device by pressing the SOS button which is allotted to her. By pressing the button, the entire system will be activated then immediately a SMS will be sent to concern person with location using GSM and GPS.

The system further contains an LED mechanism which can be flashed on to the attacker to blind him and provides an escape window for the victim. Thus providing self defense mechanism along with the alert system.

B. Motivation

In this globally developing era we still are concerned about the safety of a women .Even though the technology as reached its peak of exploring the means of safety“Are Women Safe, in India, especially?”is the question asked frequently. With surveys and understandings of what is happening around us, it is time that the country joins hands together to realize that – ‘Women are NOT SAFE in any means in India'. From the time she opens her eyes to closes it she lives with the fear of danger. Chances of getting killed being a girl before she`s born to the time when she`s born ,facing many difficulties like molestation, sexual harassment she lives with constant fear. Fig. 1 shows a plot of reported crimes against women between the year 2005-14. The plot shows that the crime against women has been increasing steeply over the time. In spite of having reforms in laws and regulations and the awareness about empowering women, there is no improvement to be seen. In this world of growing oppression towards women, there is a heightened need for providing a means of safety through technology.

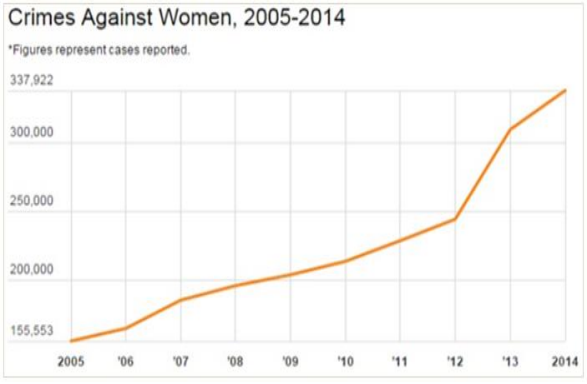

Fig 1

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C. Problem Formulation

A good solution will be a device that is portable and small, yet has a potential of providing the required set of capabilities that are good enough to tackle the problems faced by women under various situations. Such a device should provide an alerting fig 1.2 : Crime rate against women from 2005-14 system which helps the victim to reach out for help. This alerting system should be good enough to alert the right people and at the right time. This system solves this problem by giving an option to set the mobile number for whom the user wants to reach out for help.

Further a good solution should not only provide an alerting system but also must provide a self-defense tool so that the victim can escape the situation if the help takes time to arrive. The self defense is provided by the inclusion of an LED mechanism which can be used to blind the attacker and thus acts as a self defense tool.

II. BLOCK DIAGRAM

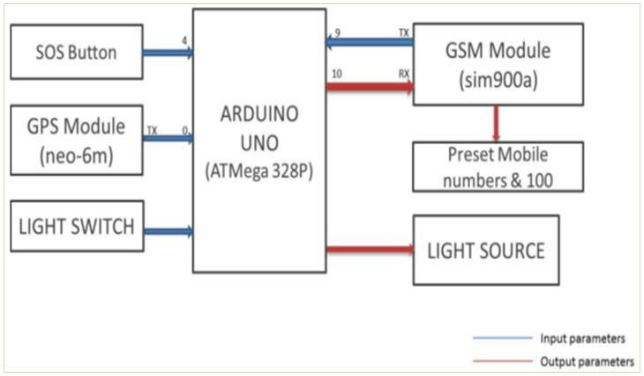

Fig 2

III. WORKING PROCEDURE

This project clearly uses two main modules of GPS , GSM and a microcontroller. When the user presses the SOS button, the GPS data is received from the GPS Module, This data is processed for Latitude and Longitude, This data is further encoded into a https link mapping to the appropriate location on the map. This data is further sent to the Mobile numbers using AT command viz., GSM Module.

IV. ALGORITHM

- Initialize GPS sensor with 9600 baud rate.
- Establish the connection between GPS and arduino by connecting GPS TX Pin to arduino RX pin 0.
- Once power is on it takes around 3 to 5 min to activate the GPS sensor.
- GPS sensor gives different data like GPGGA, GPGSV, GPGSA.
- In that we require GPGMC.
- From that we extract the required location using tiny library file.
- Finally the data is sent to preset mobile numbers using GSM Module using AT commands.

V. ADVANTAGES & APPLICATIONS

A. Advantages

- Sophisticated security.
- Safety against danger and threats.
- Alert message to mobile phone for remote information.
- Mobile number can be changed at any time and option for presetting any mobile number.

B. Applications

- Security appliances.
- Safety and security of women.
- Used as a legal evidence of crime with exact location information for prosecution**.**

VI. RESULT

The overview of the system is shown in the figure 3. When powered on, the alerting system and the LED mechanisms work as expected. The preview of the SMS sent by the system is presented in figure 4.

- *Before Execution*

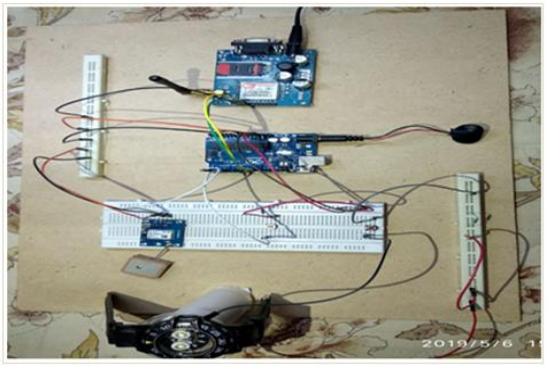

Fig 3:- System Overview

- *After Execution*

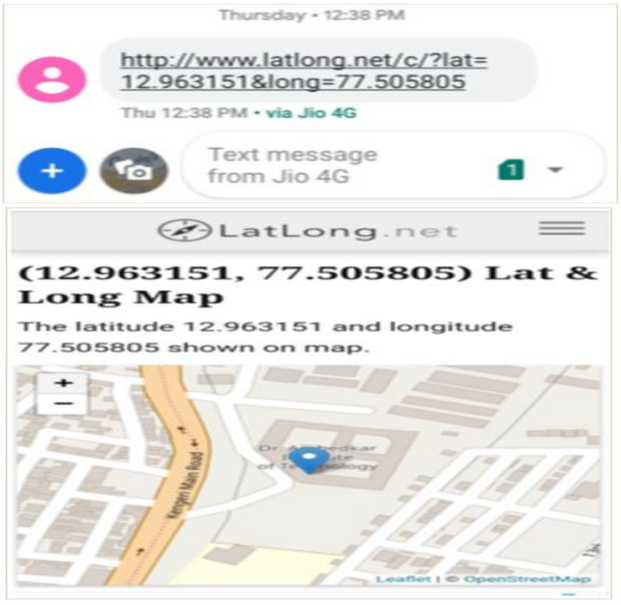

Fig 4:- Execution results

VII. CONCLUSION AND DISCUSSION:

The proposed design helps women send out a distress signal in times of need. The design, when developed further and fabricated into a daily use device such as a watch, will help women feel more secure in dangerous situations. The society we live in still has a long way to go in terms of changing its mindset, but with the use of technology such as this we can help women be more independent.

A. Future Scope

- The entire setup can be fabricated to fit into a wearable wrist watch.
- Android and i-OS Apps can be developed to provide better UI for various settings like setting up mobile number etc.
- A buzzer like mechanism can be used to seek help from neighbouring people.
- Voice recorder and camera can also be added to the system.

B. Applications

- It acts as a security system for women which can help them in emergency situations.
- It can act as legal evidence in case of an assault.
- It can even act as lost and find device.

C. Shortcomings

- The LED Mechanism has to be made more effective in Flash blinding the attacker.
- Requirement of better User Interface to set mobile numbers.

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