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Women's Safety and Tracking System with GSM AND GPS

Atharv Parbalkar[1], Shwetambari Belote[2], Shreyas Dharyekar[3], Amol Dhanawade[4], Heena Pyare[5]
[1, 2, 3, 4, 5]*Department of Electronics and Telecommunication Engineering, Vishwakarma Institute of Technology, Pune*

Abstract: This paper aims at providing reliable and robust safety device that notifaies police in the area and family whenever the user sense crisis .In today's world the life has become untroubled and comfortable due to the connectivity technologies so in this paper we have developed system that uses these technologies for the safety proposes of women .We have used the GPS sensor to track the current location of the user and GSM module to send the location to the authorities via text message .An RF Module TX and RX is also added to make the control circuitry compact.
Keywords: Women's Safety, Safety, GSM, GPS, Arduino, RF module.

I. INTRODUCTION

Even in this modern era women are feeling insecure to step out because of increasing crimes in our country like violence, harassment, abuse, etc. The corporate and IT sector are presently in boom. Many girls are working in corporate even in night shifts. There is always a feeling of insecurity among the working women. The proposed device is more like a safety system in case of crisis. This device can be fitted in a blazer. It is easy to carry this device with more features and functions. The emergency push button is held to one of the buttons of the clothes. The main purpose of this device is to intimate the family and police about the current location of the women. A GPS system is used to trace the current position of the sufferer and a GSM modem is used to send the message to the pre-defined numbers. This model is also beneficial for small children's, elderly aged people also.

II. LITERATURE REVIEW

[1] This paper introduced the main purpose of women's safety in India. To act as an emergency device for women who are being attacked or in danger. The women press the button if in danger. The SMS containing the latitude and longitude coordinates that they are sent to pre fed mobile numbers to inform them of the danger and the location. Received coordinates can be viewed on google maps to determine the location of the woman and appropriate help is provided. This concept was devised to avoid the serious crimes against women's in India. [2] Author has said that with so much advancement in technology in these modern times women safety has always been an issue. Women's are not safe most vulnerable when traveling alone. Designing a hand held safety device for women require human intervention for activating the device such as pressing the button or shaking the device after sensing the danger. They propose a solution which will try to overcome the disadvantages .The proposed work aims at designing an IoT based safety device that provides security to women by fingerprint-based method of connectivity to the device and alerting nearby people and police when a women is not safe. [3] In this paper the author has said that world is becoming unsafe for women. The crime against women are increasing. The employed women's feels unsafe due to increasing crimes. This paper proposes a quick responding mechanism that helps women. When someone is going to harass, she can just press the button and the location information is sent as an SMS alert to few pre-defined numbers in terms of latitude and longitude. The controller used is ATMEGA328P. The program used is developed in 'C' language. The purpose of this project is to make women's feel safe. [4] This paper the author narrates about women safety using GSM & GPS. A GSM technology is most possibly used for location base service monitoring and calling facilities. Here they introduced a gadget which ensures the protection of women. Which helps to identify to protect and called resources to help the one out of threaten. And also, they described that if anytime you sense danger all you had to do is hold on the button of the device. Which consist of an ATmega328 microcontroller, GSM module, GPS module, and biosensors. The biosensor which is used here is Heart rate sensor, BP sensor and pulse rate sensor. The gadget works as a normal device tracker which senses the location though GPS system and sends the location of the particular person to family members and police. [5] In this project the author says that Women's safety plays a very vital role now a days due to rising crimes against women. And to help for resolving this issue they proposed a GPS based women's safety system that has dual security feature. The proposed system consists of a duplex alert that is buzzer and message is sent through GSM. And

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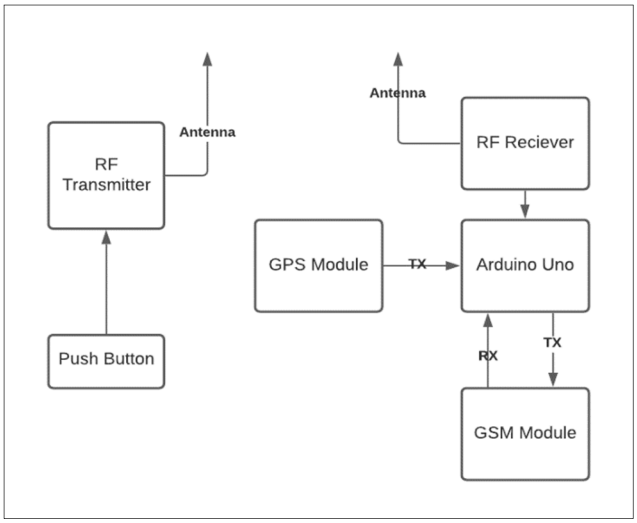
also,this system can be turned on by a woman in case she even thinks she would be in danger. This Project also presents a women safety detection system using GPS and GSM modems. The system can be interconnected with the alarm system and alert in the surroundings. And This detection and messaging system 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.

III. METHODOLOGY/EXPERIMENTAL

A. Materials/Components/Flowchart/Block Diagram/Theory

Design Overview

The Block diagram of our proposed system:



(Fig.: Block diagram)

B. Software and Components

This system consists of following component which are listed below:

1) Arduino (ATMEGA 328P)
2) RF Module
3) GSM Module(SIM900D)
4) GPS Module

a) Arduino: This is the development board which provides small plate with the same powerful microcontroller like Arduino Uno. This is small in size that uses ATMEGA328P Microcontroller. This operates on 5V DC supply. And all remaining component interface with this device. The RX and TX pin of Arduino is connected to the TX and RX of the GSM modem of SIM800 Module. D10 Pin is connected to the transmitter of The GPS module. D2 to D7 Pin is connected with LCD Display. Then by given an Accurate power supply and system ground the Arduino is ready to do their job.



(Fig. 1.1)

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b) GSM Module (SIM 900D): This is aGSM/GPRS-compatible Quad-band cell phone, which act on a frequency of 850/900/1800/1900MHz and which can be utilize for various applications such as access the Internet, make a voice call, send and receive SMS, etc. The frequency bands of the GSM modem can set by AT Commands. The baud rate is customizable from 1200-115200 through AT command. The GSM/GPRS Modem is having an internal TCP/IP stack which enables us to link with the internet via GPRS. This is an SMT type module and designed with a very robust single-chip processor integrating AMR926EJ-S core, which is very famous in various industrial products.



(Fig. 1.2)

Technical Specifications

- Applied voltage: 3.4V – 4.5V
- Power saving mode: Sleep Mode power consumption=.5mA
- Frequency bands: SIM900A Dual-band: EGSM900, DCS1800.
- Supports MIC and Audio Input
- Firmware upgrade by debug port
- Communication: AT Commands
- Speaker Input
- UART interface support
- Operating Temperature: -30ºC to +80ºC

c) GPS Module: We are using the NEO6M GPS module. The NEO-6M GPS module is a most approved GPS receiver with a built-in ceramic antenna, which provides a strong satellite search capability. This receiver has the capability to sense locations and track up to 22 satellites and identifies locations anywhere in the world. With the on-board signal indicator, we can keep trach of the network status of the module. It has a data backup battery so that the module can save the data when the main power is shut down by accident. The core heart in the GPS receiver module is the NEO-6M GPS chip from u-box. It can track up to 22 satellites on 50 channels and have a very imposing sensitivity level which is -161 dBm. This 50-channel u-box 6 positioning engine boasts a Time-To-First-Fix (TTFF) of less than one second. This module supports the baud rate from 4800-230400 bps and has the revert baud of 9600.



(Fig. 1.3)

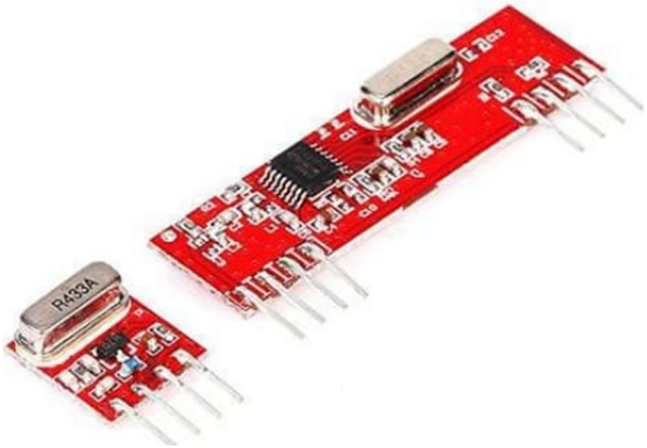
Features:

- Applied voltage: (2.7-3.6) V DC
- Applied Current: 67 mA
- Baud rate: 4800-230400 bps (9600 Default)
- Interface: UART
- Communication Protocol: NEMA
- External antenna and built-in EEPROM.

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d) RF Module

- *Transmitter Section:* In the RF Transmitter part, there will be an SOS button along with a 433 MHz RF transmitter, which will transmit the data to the receiver part without wires. The purpose of making two individual parts here is, to reduce the size of the transmitting module so that it can be worn as a wrist band.

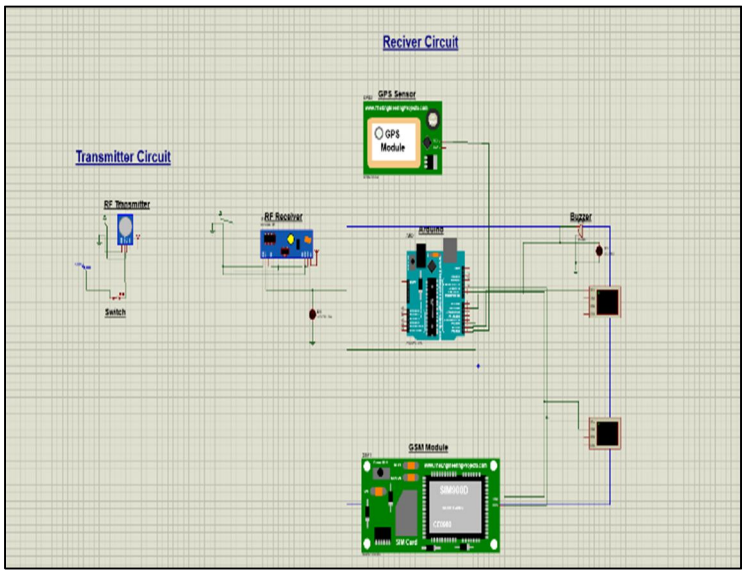


(Fig. 1.4)

- *Receiver Section:* In the RF Receiver section, the data transmitted from the wrist band (Transmitter part) is received by the device which is having a 433 MHz RF receiver. The RF receiver sends this information to Arduino via the digital pin. Arduino uno then receives the signal and processes it using the program which is flashed into it. When the victim presses the SOS button in the transmitter part, a HIGH signal is generated and passes to the Arduino side, and then Arduino sends a signal to SIM900 modem, to send an SMS to Registered user along with the GPS coordinate which has already been stored in the Microcontroller by the help of NEO6M GPS module. The circuit diagram of the Receiver side is shown as below:

C. Synthesis/Algorithm/Design/Method

1) Circuit Diagram: The project is implemented in two circuit, a transmitter section and a receiver section. The transmitter section consists of a RF transmitter with a push button connected to its data input pin. The receiver section consists of a RF receiver, Arduino, an GSM module and a GPS sensor. The RF receiver's OUT data pin is connected to pin 2 of Arduino while the GPS is connected to pins 1 and to and the GSM is connected to pins 9 and 10 of the Arduino. When the button at the receiver side is pressed the transmitter sends a HIGH signal to the receiver. The received signal is sent to Arduino which gets the current location from GPS and starts the GSM module and sends a Ask for help message to pre saved no. in the system.



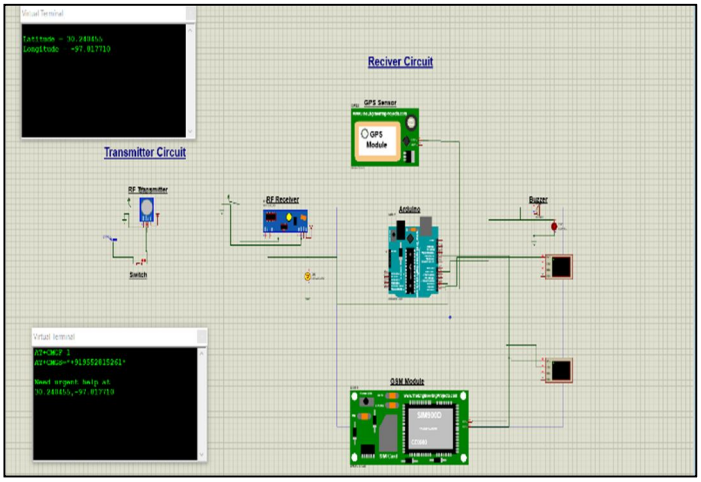
(fig.: Circuit)

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IV. RESULTS AND DISCUSSIONS

A. After activating the system, on the status of push button the remaining hardware will activate.
B. If the push button is pressed then the arduino will collect the longitude and latitude value of the present location of user using GPS Module.
C. Collected data (location) will be transferred to a provided mobile number in format of a message using a GSM Module
D. In the message, the location will be given with the alerting message of "Need urgent help".



(fig.: Result)

V. ADVANTAGES

A. Very feasible
B. Easy to maintain
C. Can be used for security purposes
D. The transmitter part is small which makes it implementable in bracelet or watch.

VI. APPLICATIONS

A. Can be used for safety and tracking of women.
B. Can be used for child tracking during school time.
C. Can be used in vehicle tracking & safety system.
D. Can be used for safety of elderly aged people.

VII. FUTURE SCOPE

A. In future, system will be able to interface with the Camera for capturing image and recording live videos also.
B. Same system can be implemented with a Wi-Fi module so the location can be stored into the cloud platform which allows monitoring with a web application or a mobile application.

VIII. CONCLUSION

A. In the present age being safe and secure is very important for women. Our main goal of this project is to design a system which is very easy to handle and provide personal security system.
B. This design will deal with most of the censorious issues faced by women and will help them to be secure. present systems provide the safety by using the internet connection through apps in the android phones and tracking the vehicle this type of security mechanism is very difficult to use.
C. The proposed system will provide the latitude and longitude values of location of the sufferer which can further be tracked using Google maps.
D. By using this system, we can bring down the crime rate against the women. Women's security is a critical issue in present situation. The crimes can be lessening with the help of real time implementation of our proposed system

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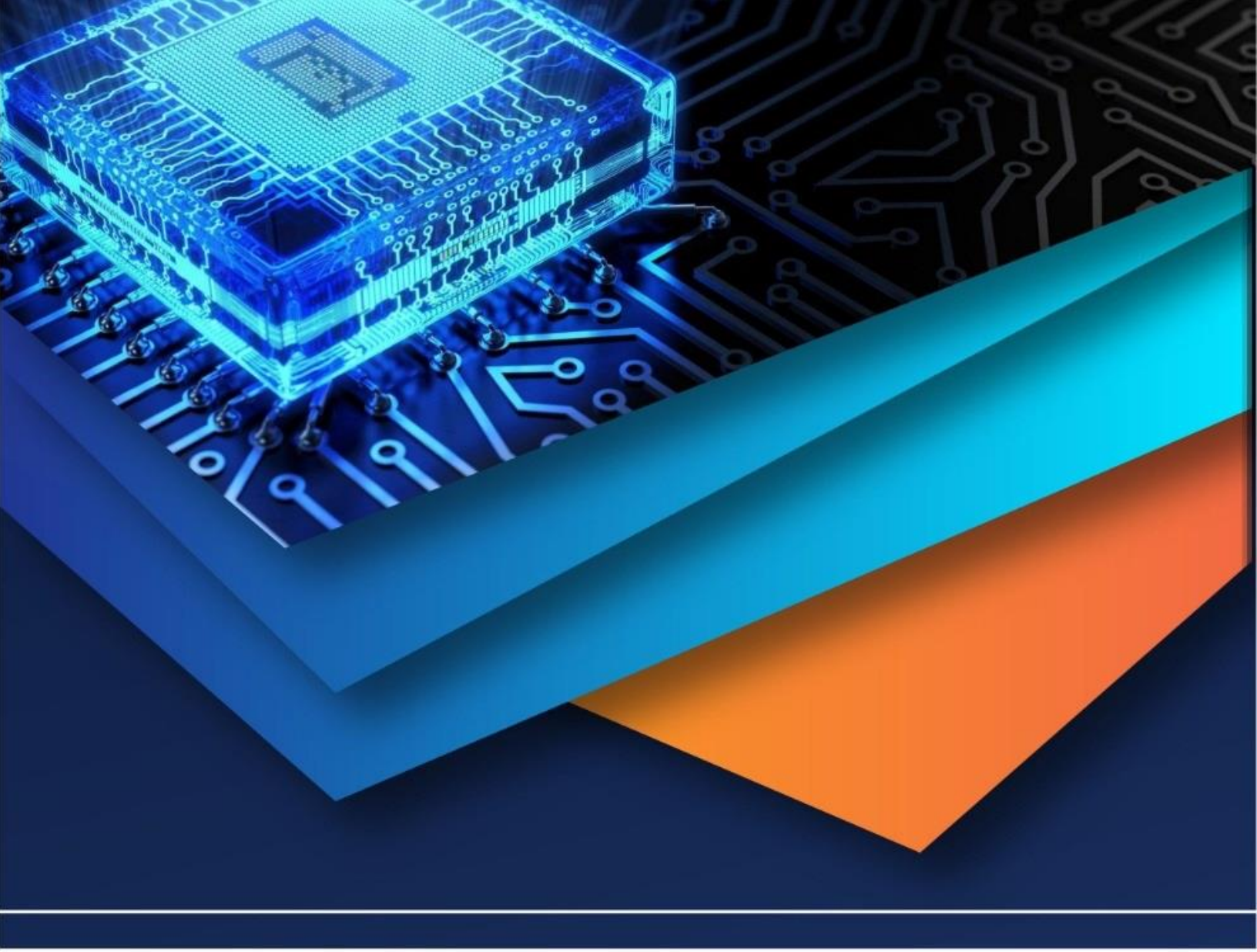
IX. ACKNOWLEDGMENT

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