
WOMEN SECURITY SYSTEM USING ARDUINO WITH GPS AND GSM

S. Hima Keerthi*¹, I. Rashmika*², P. Harika*³, R. Vanibai*⁴, R. Sridevi*⁵

*¹Guide, Department Of Computer Science And Systems Engineering, Andhra University College Of Engineering For Women, Andhra Pradesh, India.

*^{2,3,4,5}Student, Department Of CSSE, Andhra University College Of Engineering For Women, Andhra Pradesh, India.

ABSTRACT

In every way, the world is getting more dangerous for women. Women's crime is on the rise. Due to an increase in crime, employed women are feeling unsafe. This study suggests a quick-response method to assist women in times of need. When someone is going to harass a woman, she can press the button and her current location information is transmitted as an SMS alert to the pre-defined numbers based on latitude and longitude. The controller used is ARDUNIO UNO. It is interfaced with a push button, a GPS module, a GSM modem and an LCD Display (16×2). When the switch is hit, the controller uses a GSM modem to transfer the current location data from the GPS module to the predetermined phone number. The program is developed in 'C' Language. This project's goal is to provide women a sense of security.

Keywords: Women Safety, Arduino, GSM, GPS, SMS Alert.

I. INTRODUCTION

Safety has been a major concern for women for many years. Women feel unsafe not only outside but inside their homes as well. A few places in India have such horrific conditions where women feel intimidated to even step out of their house when it gets dark. The corporate and IT sector are currently in boom and in present, many women are working in those sectors. Women are required to work night shifts as part of their job. So, there is no suitable transportation, such as buses, which are not available at that time, and cab services, which are less available and often pricey in remote locations. As a result, women find it difficult to go home or walk alone. In the event of an emergency, the proposed device functions more like a safety mechanism. It's a small portable device with a lot of features and functionalities. The primary aim of this device is to notify the registered emergency number of the women's current position. The victim's present location is tracked using a GPS system, and the message is sent to a pre-determined number using a GSM modem. This type is also appropriate for little children and the elderly.

II. METHODOLOGY

System Requirements:

Software Requirements:

- Operating system: Windows
- Compiler: Arduino compiler
- Programming Language: C

Hardware Requirements:

- Arduino (ATMEGA 328P)
- LCD Display (16×2)
- GSM Module (SIM800A)
- GPS Module
- Push button
- TX and RX LEDs
- **Arduino:**

The Arduino Nano is small in size that uses ATMEGA328P Microcontroller. It operates on 5V DC supply. The RX and TX pin of this device is connected to the TX and RX of the GSM modem of SIM800 Module. D10 Pin is connected to the TX of The GPS module. D2 to D7 Pin is connected to the LCD Display.

➤ **LCD Display:**

This display contains two internal byte wise registers, one for the commands (RS=0) and second for character to be displayed (RS=1). It also contains a user programmed RAM area (the character RAM) that can be programmed to generate any desired character that can form using a dot matrix.

➤ **GPS:**

When Push button is pressed, GPS starts receiving signals from 4 satellites out of the 24 satellites in the orbit. Once if the connection is established the latitude and longitude values of the current location are obtained. The GPS acts as a transmitter. The 5V supply is given to the GPS from the controller.

➤ **GSM Module:**

The GSM module can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number. GSM/GPRS modem is a class of wireless modem devices that are designed for communication of a computer with the GSM and GPRS network. It requires a SIM Card just like a mobile phone to activate communication with the network.

➤ **Push Key:**

When it is pressed then it will send GPS signal to the controller, then controller will send the GPS co-ordinates via GSM to the pre-defined numbers.

➤ **TX and RX LEDs:**

There are two pins: TX (transmit) and RX (receive). These are responsible for serial communication. Red light blinks to indicate that the message has been transmitted to the registered emergency number and green light blinks, when the message is received by the pre-defined number.

III. MODELING AND ANALYSIS

The Block diagram and the Flowchart of the proposed system is given below:

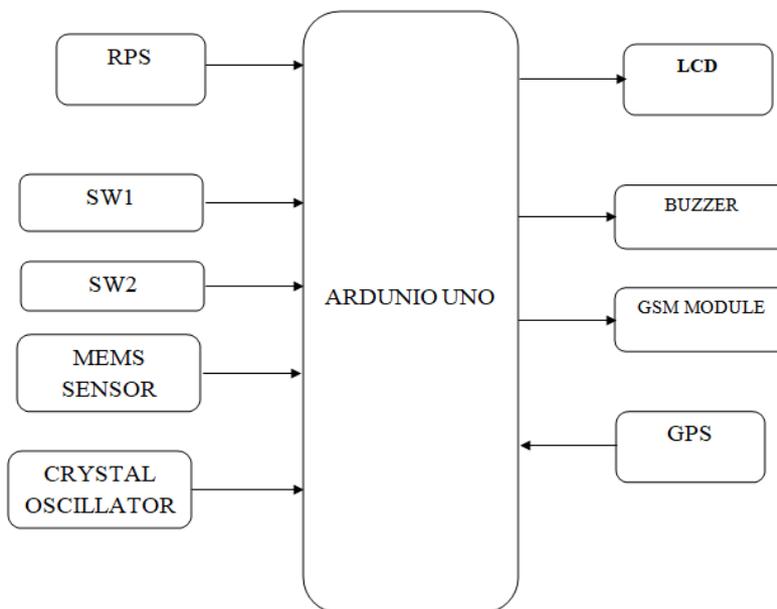


Fig 1: Block diagram of proposed system

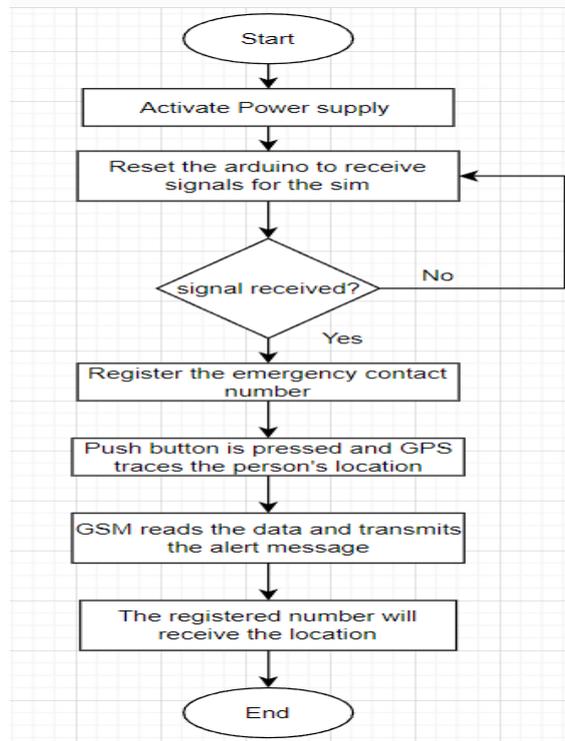


Fig 2: Flowchart of proposed system

Working:

The entire implementation is carried out on an Arduino microcontroller, with the Arduino compiler serving as the software implementation tool. The device is originally connected to the Arduino compiler via Arduino wire. The code written in the C programming language is run and compiled. It's then double-checked for any problems. The device is plugged in and linked to the power supply if there are no issues. In the sim holder of the GSM module, we insert a sim from any network with a compatible frequency. Underneath the Arduino board is a button which when pressed, resets the device. The sim receives the signal from the surrounding towers after being rebooted. As an indication, the LCD displays a message labelled "SEND MSG TO MOBILE NUMBER".

After this, the emergency contact number transmits his or her number as a message to the GSM module's inserted sim in order to be registered. The number is sent in the format *80083XXXXX. After that, the emergency contact number appears on the LCD screen, indicating that it has been registered.

In the event of an emergency, the individual carrying the safety kit will press the microcontroller's push button. The device is provided with two alternate push buttons for "Need Help" and "Need Emergency". When either of the button is pressed, the controller retrieves the women's current position data from the GPS module and sends it to a predefined number via a GSM modem.

Two blink indicators are included on the Arduino board: Red and Green. When a message is transmitted to the registered mobile number, the Tx transmitter pin blinks red, and when the message is received by the registered mobile number, the Rx receiver pin blinks green. This indicator tells the women whether or not the message was delivered successfully.

As a result, the designated number will receive the women's location in terms of latitude and longitude, allowing them to assist the women quickly.

IV. RESULTS

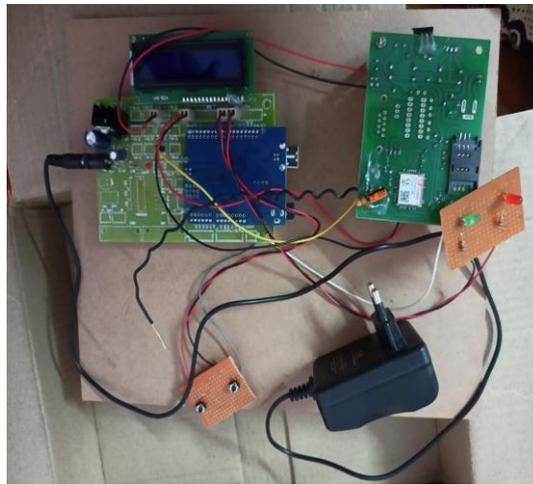


Fig 3: Hardware set up of system

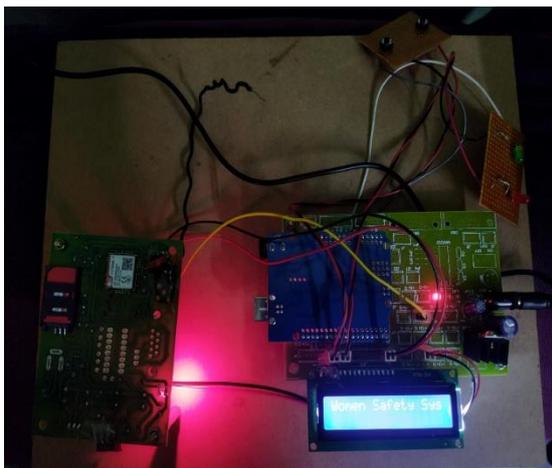


Fig 4: When the power supply is enabled, a message is displayed on LCD screen

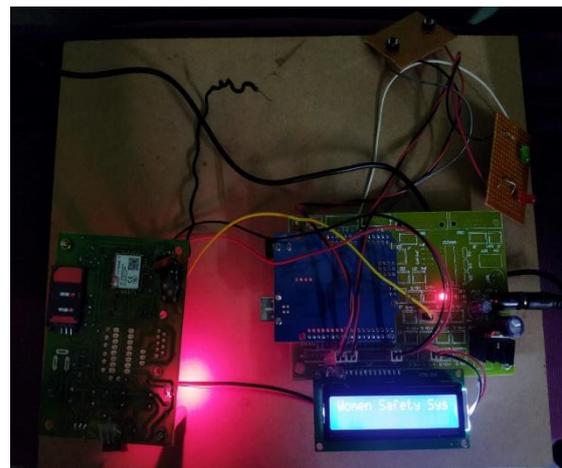


Fig 5: After resetting the Arduino, the sim receives the signals



Fig 6: The LCD displays the registered mobile Number

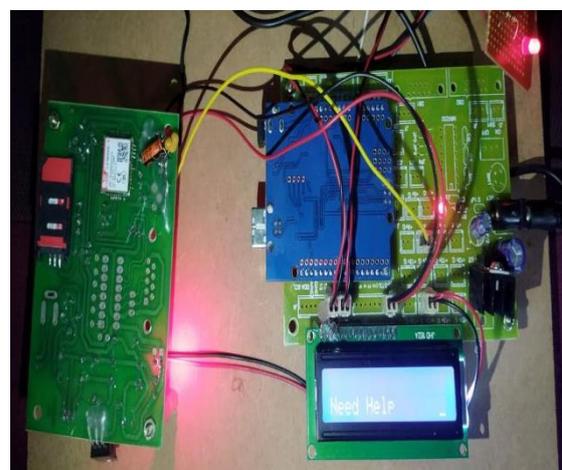


Fig 7: The person in case of emergency presses the push button for help

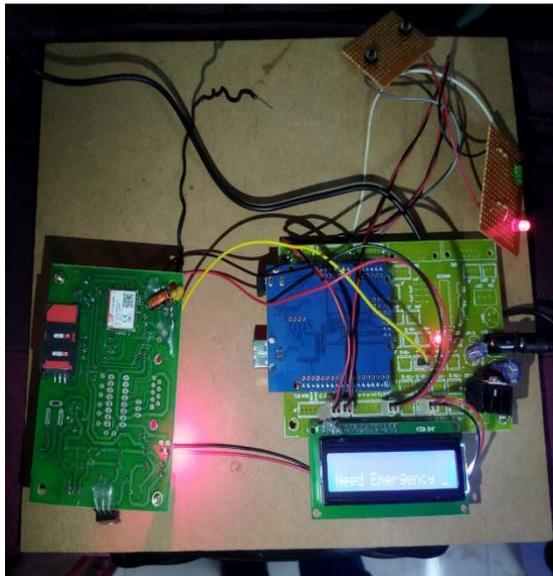


Fig 8: Alternate push button for emergency

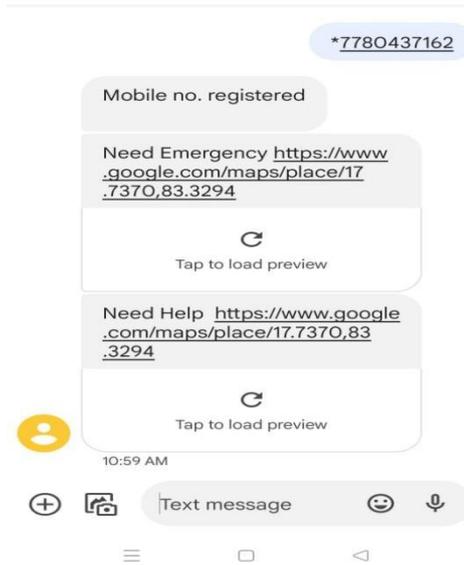


Fig 9: The registered mobile number receives the location

V. CONCLUSION

In the future, the system might be connected to a camera to capture images and record live video. Our project concept expands on the idea of designing a system that will make every place and hour safer for women. With a single touch of a button, this technology will geotag and send an SOS alert to the local police station, close contacts, and people in and around the crime scene. The goal is to compensate for the time it takes the cops to get at the scene. The Arduino ATMEGA can be equipped with a camera and microphone. We can use this to capture photographs and record audio of people who are in difficulty, and then send that information using the GPM and GPS modules. The proposed design will address significant challenges that women have experienced in the recent past and will provide technical solutions to these issues. This technology has the potential to alleviate the anxiety that every woman in the country has about her safety and security. The demand of the day is to be protected and secure. The goal of this project is to design and build a device that is so small that it can serve as a personal security system. This design will address the majority of the essential difficulties that women confront and will assist them in feeling secure. The ability to follow the vehicle is provided by existing systems, but no alternative emergency mechanism is given. The suggested system allows users to see the victim's location in terms of latitude and longitude, which can then be followed using Google maps. This approach aids in the reduction of crime against women.

VI. REFERENCES

- [1] Poonam Bhilare, Akshay Mohite, Dhanashri Kamble, Swapnil Makode and Rasika Kahane, "Women Security System using GPs and GSM based Vehicle Tracking", International journal for research in emerging science and technology, volume 2, issue-1, January 2015.
- [2] Mr. Vaibhav A. A study based on Women Security System:
<http://ijsetr.org/wp-content/uploads/2017/08/IJSETR-VOL-6-ISSUE-8-1241-1243.pdf>
- [3] Prof. Basavaraj Chougula, Archana Naik, Monika Monu, Priya Patil and Priyanka Das, "SMART GIRLS SECURITY SYSTEM", International journal of Application or Innovation in Engineering & Management (IJAIEM), volume 3, issue- 4, April 2014, pp.281-284
- [4] Dr. Sridhar Mandapati, Sravya Pamidi, Sriharitha Ambati, "A Mobile Based Women Safety Application (I Safe Apps)", IOSR Journal of Computer Engineering (IOSR-JCE): Jan – Feb, 2015.
- [5] Andrea Z and Lorenzo V., "Internet of Things for Smart Cities" IEEE Internet of Things Journal, vol/issue: 1(1), Feb 2014.
- [6] Isna K. and S. D. Sawant, "Integration of Cloud Computing and Internet of Things", International Journal of Advanced Research in Computer and Communication Engineering, vol/issue: 5(4), April 2016.

- [7] Sonali D. T., "Cloud Computing and Software-Based Internet of Things", International Journal of Advanced Research in Computer Science and Software Engineering, vol/issue: 6(4), April 2014.
- [8] Jonathan K., "Using Active Queue Management to Assist IOT Application Flows in Home Broad band Networks", 2017 IEEE Internet of Things Journal, vol/issue: 4(5), October 2017.
- [9] Pengfie Z., et al., "Secure Location of Things (SLOT): Mitigating Local Spoofing Attacks in Internet of Things", IEEE Internet of Things Journal, vol. 4, December 2017.
- [10] Akriti S., et al., "Intelligent Accident Management System using IOT and Cloud Computing", 2nd International Conference on Next Generation Computing Technologies, October 2016.