

Internet of Things Based Smart Woman Security System using GSM and GPS

Dr. S. Sreenath Kashyap¹, Dr. Vipul M Dabhi¹, Manu Koushik M², Prashanthi², A. Ruchitha²

¹Professor, ²UG Scholar, ^{1,2}Department of ECE

^{1,2}Kommuri Pratap Reddy Institute of Technology, Ghatkesar, Hyderabad, Telangana

Abstract: This Project presents an automotive localization system using GPS and GSM-SMS services and alerts over IOT for woman security. The system permits localization of the woman and transmitting the position to the rescue team as a short message (SMS) and over Internet. The system can be interconnected with the car alarm system and alert the surrounding people to help woman. This security tracking system is composed of a GPS receiver, Microcontroller, and a GSM Modem and IOT module. When woman need help that time, she will press security alert switch then GPS Receiver gets the location information from satellites in the form of latitude and longitude with alert through IOT. The Microcontroller processes this information, and this processed information is sent to the certain person using GSM modem. The presented application is a low-cost solution for woman in risk. The proposed solution can be used in other types of application like child security, woman security, where the information needed is requested rarely and at irregular period of time (when requested).

Keywords: Women security applications, Internet of Things, GSM, GPS, Arduino controller.

I. Introduction

Nowadays women feel insecure as they face more harassment problems, not only women even girl child faces the same type of harassment and their entire life becomes a big question mark. They feel unsafe even in their work places, while traveling and in their residence too. Round the clock in a day they feel insecure. So it is essential to make our women feel safe and secure. It is our responsibility to make our women safe and provide a safe and healthy environment for them to live. When compared to men, women are less strong in physic but nowadays they are coming up in all fields equally to men. It is our duty to help them in case of emergency situation. To overcome from the risk the victim can call the resources as soon as possible for getting help and escape from the critical situations like rape, sexual assault, robbery etc. If women are having security apps and the system with them they will feel safe and secure. This security system is useful for women in making them feel they are in assistance of someone. On using this system the victim can call immediately their dear ones when they are in dangerous situation or can send alerts continuously. It can also be used to identify the risky areas and call for help. Mainly the system designed and apps are a great awareness to the working women to feel confident and safe. The only thing they need to do is that the system must be in alert mode. Let us discuss some of the women security systems available. Of recent, progressive studies related to this research are usually not flexible, as the interface provided for tracking is usually application limited to certain devices say android, and the communication protocol are mostly short ranged like Bluetooth, these are limitations addressed in this proposed system. This proposed system is implemented with a GPS, and wide range communication protocol LoRa WAN. The most progressive breakthrough in this proposal is the internet of things used to create a very accessible interface for the user to track and locate missing wallet. The flexibility of this interface created on Ubidot platform is that, it just requires internet to be accessed on any device, it is not limited to any device because as it is not application-based platform, but internet-data based. The range and accuracy of the tracking system is 2-5km and over 90% respectively. The aim

of this proposed system is to design and develop a sustainable system and platform to monitor, track and locate wallets; when missing. Implementing GPS system for real tracking at 2-5km range and to develop an Internet of things (IOT) platform for data visualization, monitoring and analyzing using an Arduino Uno ESP8266 with Lora WAN capability. India is known for its secularism and tradition for many years. Women are treated as goddess in India. Therefore, safety for women in India should be the first priority. There have been innovations that have led to some steps forward in safety of women. Many apps have been built, and there are some devices that women need to carry for their safety. One of which is wrist band. The IoT Women Safety' will provide safety and security to each and every women, whether rich or poor, whether working or housewife. This plan proposes the way in which each woman could be protected from any mishappening and would be provided help within seconds when in need. Moreover, she does not need to carry any device with her. This idea will let every women walk on the road with their head held high and without any fear. The Internet of Things (IoT) has become an era of the web facilities through Internet, which enables devices to connect and exchange information with each other with the help of internet. IoT is a framework that is used for gathering information from physical world such as sensors or triggers or cell phones. It takes that data in some of the OSI Model layer and then it transfer to the server. The data must have the ability to communicate with the physical world, humans and other objects with One Machine to Machine (OM2M) environment. Internet of Things, improves global style of living, and it can be used for various purposes in fields including such as Hospitals, rural-urban areas, games, farming, automating home, smart skyscraper, advance traffic management and many other purposes.

II. Literature survey

An Innovative Approach for Women and Children's Security Based Location Tracking System, Dr.Velayutham.R, Samarium, Sorna Rajeswari.M, In countries like India women are grooming in good sign. Women and girl child in many of the countries feel unsafe and frustrated due to lack of security and safety for them. Each and every minute somewhere in the world they are harassed and losing their life. At this situations women feel helpless and don't find any way for protecting them and call for help from the family members or from nearer ones. Protecting the women out of danger is much needed for their safety. The security system helps them to get rid of such worries and give hands in critical situations. System comprising of GSM, GPS and Google map for sending the current location of the victim to any of the trusted relations and for detecting the location through satellite and for tracking the locations of the victim respectively are used. Women Employee Security System using GPS And GSM Based Vehicle Tracking, Authors: D. Amala Devi, B.VeerawamiNayak, In today's world the major critical issue is the women security. Each and every individual is responsible for making them feel safe when they are outside or when they are in home. Everyone must ensure to help women and come out of this issue. The security system with technologies like GSM, GPS was used. This system is used along with the advanced specialized software for tracking the women who are in dangerous situation. When the victim is in dangerous situation the system will be useful in tracking the victim and also alerts the dear ones of the victim through messages. All they need to do is that they have to press the danger button. Google maps are used for finding the exact location of a vehicle send by the victim. Nowadays the majority of the employers ensure their women employee who is working late nights. They are imposing this through the security system and specialized apps. Mainly in most of the security system GSM and GPS combination is used for their women employee vehicle tracking. Women Empowerment: One Stop Solution for Women, Author: Sharifa Rania Mahmud, Jannatul Maowa, Ferry Wahyu Wibowo It is estimated that by 2050 our world population

will be around nine billion whereas now it is around only seven billion. Around 53% of the women population is experiencing many security problems throughout their life.

III. Proposed system

Proposed system implemented using GSM, GPS, and IOT. Wireless technology. This system consisting a panic button which alerts the authorized person. A security device which is in the form of button. The button is set alongside the clothing, when the casualty presses the button, it will send the alarm message to the enlisted numbers with the assistance of GPS system. The button gadget will be empowered with the camera to trap the Images and video, and every one of those caught pictures will be sent to the enrolled number. They conceived a framework primarily comprises of four sections which incorporates Location tracking, Image Capturing and storing, storing and sending and the alarm. The area following framework includes refreshing of the present area of the casualty by the short message service (sms), to her relatives and the cop. The area following framework will refresh scope and longitude of the casualty from numerous spots and different times. Once the user, triggers the area following system, the miniaturized scale controller will order the GSM to transmit the information utilizing commands. They utilized Button spy camera, which catch the picture and store to SD card and put something aside for future reference. Then the following module, alarm which catch the consideration of others for the crisis salvage.

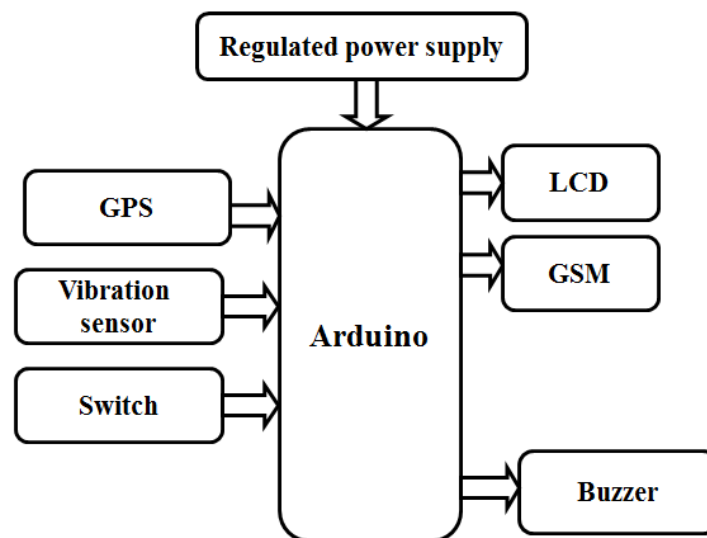


Fig.1: Block diagram

Arduino

The Arduino Uno R3 is a open source microcontroller board based on the ATmega328P chip. This Board has 14 digital input/output pins, 6 analog input pins, Onboard 16 MHz ceramic resonator, Port for USB connection, Onboard DC power jack, An ICSP header and a microcontroller reset button. It contains everything needed to support the microcontroller. Using the board is also very easy, simply connect it to a computer with a USB cable or power it with DC adapter or battery to get started. The recommended range is 5v to 12v for Arduino Uno.

Features:

Microcontroller: ATmega328P

Operating Voltage: 5V

Input Voltage: 7-12V

Digital I/O Pins: 14 (of which 6 provide PWM output)

Analog Input Pins: 6

DC Current: 40mA

Flash Memory: 32 KB

SRAM: 2 KB

EEPROM: 1 KB

Clock Speed: 16 MHz

LCD Monitor

Liquid Crystal Display used to display the parameters for status of the proposed system. This can display 32 characters having 2 columns. When each sensor is activated, corresponding message will be displayed in 16*2 LCD modules. In this we use four data pins using these pins we transfer the data from micro preprocessor to LCD.



Fig. 2. 16X2 LCD

IOT- Module

Internet of things used for controlling any device or monitoring the device status through internet. This proposed system we use this IOT module for taking all parameters data and post into the cloud called server. ESP8266 modules as IOT module it can operate through Wi-Fi frequency concept.



Fig. 3. ESP 8266

Buzzer

Buzzer is the output module for alerting of any parameter changes. if any sensor increases the threshold value or if increases then microprocessor alert us by using this system.



Fig. 4. Buzzer

Software

Software is the important parameter to make the device automation. In proposed implementation we used embedded c programming language and compiler Arduino IDE we used. Here we used Arduino IDE software for programming write up and execution of entire system.

Mercury switch

A mercury switch is an electrical switch that opens and closes a circuit when a small amount of the liquid metal mercury connects metal electrodes to close the circuit. There are several different basic designs (tilt, displacement, radial, etc.) but they all share the common design strength of non-eroding switch contacts.



Fig. 5. Mercury switch.

The most common is the mercury tilt switch. It is in one state (open or closed) when tilted one direction with respect to horizontal, and the other state when tilted the other direction. This is what older style thermostats used to turn a heater or air conditioner on or off. The mercury displacement switch uses a 'plunger' that dips into a pool of mercury, raising the level in the container to contact at least one electrode. This design is used in relays in industrial applications that need to switch high current loads frequently. These relays use electromagnetic coils to pull steel sleeves inside hermetically sealed containers.

GSM

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.

Modem specifications

The SIM300 is a complete Tri-band GSM solution in a compact plug-in module.

Featuring an industry-standard interface, the SIM300 delivers GSM/GPRS900/1800/1900Mhz performance for voice, SMS, data and Fax in a small form factor and with low power consumption.

The leading features of SIM300 make it deal fir virtually unlimited application, such as WLL applications (Fixed Cellular Terminal), M2M application, handheld devices and much more.

1. Tri-band GSM/GPRS module with a size of 40x33x2.85
2. Customized MMI and keypad/LCD support
3. An embedded powerful TCP/IP protocol stack
4. Based upon mature and field proven platform, backed up by our support service, from definition to design and production.

GPS Module

The Global Positioning System (GPS) is a burgeoning technology, which provides unequalled accuracy and flexibility of positioning for navigation, surveying and GIS data capture. The GPS NAVSTAR (Navigation Satellite timing and Ranging Global Positioning System) is a satellite-based navigation, timing and positioning system. The GPS provides continuous three-dimensional positioning 24 hrs a day throughout the world. The technology seems to be beneficiary to the GPS user community in terms of obtaining accurate data up to about100 meters for navigation, meter-level for mapping, and down to millimeter level for geodetic positioning. The GPS technology has tremendous amount of applications in GIS data collection, surveying, and mappin The Global Positioning System (GPS) is a U.S. space-based radio navigation system that provides reliable positioning, navigation, and timing services to civilian users on a continuous worldwide basis -- freely available to all. For anyone with a GPS receiver, the system will provide location and time. GPS provides accurate location and time information for an unlimited number of people.

IV. Hardware results

We designed the hardware of internet of things based woman security monitoring system. AI modules are integrated to the raspberry pi processor. The initial state of all the sensors which displays their measured values on the LCD screen. The same data generated by the sensors will post into the iot server for wireless data accessing system.

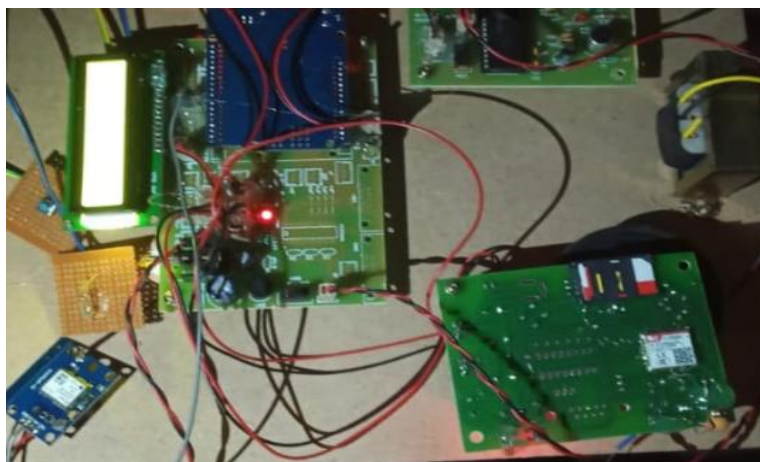


Fig. 6. Hardware model.

Hardware model of RPI woman security system which integrated GSM, GPS, LCD, VIBRATION sensor. When button pressed then automatically sends the exact location.



Fig. 7: GPS Location alert when panic.

V. Conclusion

We designed the hardware of internet of things-based woman security monitoring system. All modules are integrated to the raspberry pi processor. Hardware model of RPI woman security system which integrated GSM, GPS, LCD, Vibration sensor. When button pressed then automatically sends the exact location. From the above discussed details, we can design the system much more efficient using the technologies such as GSM, GPS, and Google Maps etc. for ensuring the women safety. The system can be implemented in the form of women wearables. Women can use this security system when they feel they are not in a safe situation. For example, when they are traveling alone in auto/cab during night or when they are travelling with anonymous person, we can use this device. If they do one click the system can send the exact current location of the victim to the registered contact numbers. Then we can capture an image and it can be shared through telegram to the registered numbers as evidence. so this will be very useful for further investigation.

References

- [1] Dr. Velayutham.R, Sabari.M, Sorna Rajeswari.M, "An Innovative Approach for women and children's security Based Location Tracking System" On International Conference on Circuit, Power and Computing Technologies IEEE [ICCPCT] 2016.
- [2] Dhole, "Mobile Tracking Application for Locating Friends Using LBS", International journal Innovative research in computer and Communication engineering, vol:1, Issue: 2, April 2013.
- [3] S.Vahini, N.Vijaykumar "Efficient Tracking for Women Safety and Security Using IOT" International Journal of Innovative Research in Computer and Communication Engineering Vol. 5, Issue 2, February 2017.
- [4] B.Chougula, "Smart girls security system," International Journal of Application or Innovation in Engineering & Management, Volume 3, Issue 4, April 2014.
- [5] Prof.A.Maharajan "A survey on women's security system using GSM and GPS"- International Journal of Innovative Research in Computer and Communication Engineering Vol 5, Issue 2, Feb-2017.
- [6] Anupriya. Deshpande, Madiha Mehvish "Effect Of Premenstrual Syndrome On Cardiovascular parameters And Body Weight In First Year Medical

Students” Journal of Evolution of Research in Human Physiology/ Vol. 2/
Issue 1/ Jan-June, 2016.

- [7] Prof-Dr.K.Valamarthi “Android based Women tracking system using GPS,GSM” International Journal for Research in Applied Science & Engineering Technology (IJRASET) Vol4, Issue 4, April-2016.
- [8] Gowri Predeba.B, Shyamala.N, 3Tamilselvi.E Ramalakshmi.SSelsi aulvina.C “Women Security System Using GSMAnd GPS” International Journal of Advanced Research Trends in Engineering and Technology (IJARTET) Vol. 3, Special Issue 19, April 2016.
- [9] T. Mekala, P. Nandhini,” Modified Agglomerative Clustering for Web Users Navigation Behavior”, International Journal of Advanced Networking and Applications, Vol. 05, Issue: 01, PP.1842-1846,2013