Women And Child Security System

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Abstract - *Despite the cultural norms of deification and religious tolerance towards women, children are still at risk in India's 21st century due to the prevalence of violent crimes against women. As violence against women and children is on the rise, technology and the safety of women and children must be a priority in society. Many crimes like murder, rape, assault, and sexual assault in the workplace or anywhere in the world have come to light and some of the incidents in India are not recorded or suppressed, some of the witnesses have been politically motivated or forced. Seeing this abuse of women and children disturbs us and compels us to do something to save their safety. Therefore, in this project, we are changing the concept of empowering women and children with the help of technical tools that use Arduino, GPS, and GSM to ensure their safety. The system's features include an emergency button, buzzer, GPS location tracking, GSM communication, and LCD visual aids. Users can press the panic button when an accident or emergency arises and create a quick response mechanism. The system has a buzzer that sends alerts and GPS coordinates via SMS using your smart emergency contacts' GPS and GSM functions, set to the latitude and longitude of that location. This tool is used for self-defense and can reduce crime rates by providing real and adequate safety for women and children. This project aims to save women and children.*

Key Words: Arduino, GPS, GSM, Buzzer, Women and Child Security System

1. INTRODUCTION

In today's era, women continue to grapple with the feelings of insecurity when stepping out of their homes due to alarming increase in crimes such as harassment, abuse and violence in our country. India in last few decades progressing to be the superpower in the world. With the IT advancements thriving the huge workforce is molding the country. The women are the essential part of it, but there remains the fear of unknown in women's mind those who particularly works in night shifts. India's superpower is their youth and so the children is the future. And many crimes take place against children too like kidnapping and the child labor and trafficking of them. According to the annual reports of National Crime Record Bureau (NCRB) there was a spike of over 4.45 lakh crime atrocities takes place against women which is around one in every 51 minutes. The Delhi "Nirbhaya" case that triggered the whole nation was the greatest motivation for

this project. The development of satellite technology helped in the locations of an object primarily used in automobiles and vehicles. The GPS used in the cars and public services helps to eliminate so may accidents. The GPS/GSM technology is a versatile system in today's world it has wide range of applications in the land construction and transport business and so more. We have created a system using the Arduino based GPS and GSM module. Which work as the GPS trace the current location while GSM send message to the numbers saved in the receiver or to the system, as it acts as the emergency number saved in it. The notion behind this to be the user friendly for both children and women, its use case in children scenario is just like if the children of age around (5-6 years) roaming in the area somewhat a distant more than range prescribed in the given invention than it will send the message to their parents which will notify by the coordinates send by the GPS to that particular number. This evolving world has created so many threats to the women on and offline world, the sheer threat to their life in online world through cyberbullying, cyberstalking and body shaming. The technology we have if anyone try to harass a women and children then they can press the button which also the panic button attached to the device that there it generates a signal in the form of 0 and 1 and then it goes to the microcontroller and it's connected to pins of that and then it gives you latitude and longitude. It also uses a programming language to code the locations and interfacing the components with each other, this gives the slight contribution to protect the women and child from the crimes taking place in the world.

2. LITERATURE SURVEY

In this project we are addressing the crisis confronting by the women and child. The security system comprises of the microcontroller ATmega328P, GPS and GSM technology and the Arduino here is easily accessible to the different components used in this project and it is compatible with the different components. The Arduino AT mega 328P is a general-purpose microcontroller that is at the heart of electronics projects due to its simplicity, flexibility, and reliability. By using this Arduino, it helps the developers to program for this project By Arduino IDE. It requires the knowledge of C programming to implement those functions and the microcontroller must be connected to some sort of hardware for programming. We can use a USB serial port there, it provides an interface

between computer and the hardware. The paper [1] deals about an intelligent security system for women and child. Nowadays, young girl and women suffer fear from various types of harassment to sexual incidents like rape and molestation. It is observed on streets, public transport, parks, around schools and workplaces. A new report from WHO tells 35% of women in worldwide have experienced violence. It includes a monitoring device, the output of which is processed to determine insecure environments. A recent study by NCRB it reported 4% increase in the crime against women from 2020 to 2023. And country capital is top on the charts. We have [2] consolidated GPS with one of the essential assistances of an advanced cell which is GSM all the more explicitly SMS in a single framework. Our proposed model contains different components which measures boundaries consistently. In case of an emergency a message will be sent to the off gatekeepers just as police, by either pressing the panic button, and through they generate a signal to generate the real time location of victim and track it down through using GPS and GSM technology. Here [3] GSM is referred by mobile communication magazine and the international journal of recent scientific research LCD is used in this project to get feedback from the system, it is also used to display longitude and latitude of people by using their coordinates information and here the interfacing is done through the Arduino with LCD. In this the GSM system is used to send the message to the numbers saved into the system. The notion is simple yet to make impact by making it user friendly, easily accessible and flexible to the user. It has a buzzer incorporated in it which when the emergency button is activated so the buzzer will generate high pitch sound to capture the attention of nearby peoples for the help. This system also involved the field of embedded system and give us the opportunity to protect girls and child in this world. The violations [4] against women is observed across the public workplaces and parks, schools and anywhere on the road. A report tells from WHO that 35-40 % women in their life have faced any type of harassment or violence in their life. This project helps in the monitoring those adverse situations by processing the vicinity environment around it. We can put this system in those areas where there are chances of women getting harassed, molestation happened just like shopping malls footpaths, corporate offices and installations of these emergency button will empower women for their safety. The main advantage of this system is that user does not have to carry smartphone in the situation of the difficulty. As the through the technology advancements, we can also put these devices into the wearable device setup so that it can us more easily, this device can pe put inside a necklace or inside shoes or sandals with the integration of this device with the mobile application is done through the environment of IOT and application development. As India is emerging the new gen superpower and still facing this issue is worrying [5] but certain innovators had developed an intelligent system that used a pressure switch. So, when

they compress the switch then intimation will be sent to parents followed by a call. If it is unanswered then it would be redirecting the police.

3. BLOCK DIAGRAM

ARDUINO NANO - The Arduino Nano, a compact yet powerful microcontroller board, stands as a hallmark of versatility and innovation in the realm of electronics. Built upon the renowned Arduino platform, the Nano boasts a small form factor while retaining robust capabilities for a myriad of projects. Equipped with a wealth of input and output pins, it facilitates seamless interfacing with various sensors, actuators, and peripherals, making it an ideal choice for prototyping and tinkering. Its ATmega328 microcontroller offers ample processing power for executing intricate tasks, while its USB interface simplifies programming and debugging processes. Despite its diminutive size, the Arduino Nano is renowned for its reliability, efficiency, and affordability, making it a preferred choice for hobbyists, educators, and professionals alike. From home automation projects to IoT applications and beyond, the Arduino Nano continues to inspire creativity and drive innovation in the ever-expanding landscape of embedded systems.
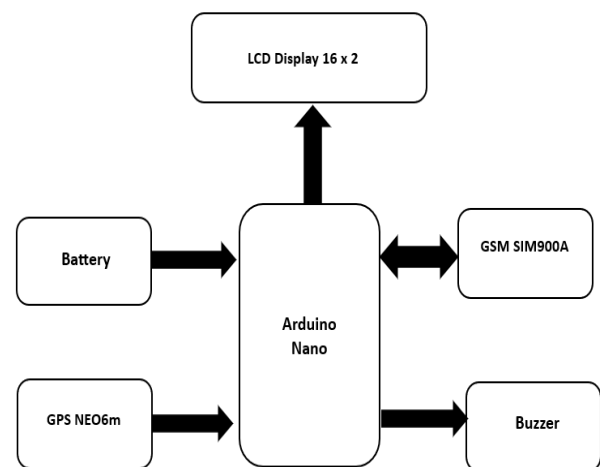

Figure 1: Block Diagram

GSM SIM900A - The GSM SIM900A module is a versatile and widely used component in various electronic applications, particularly in the realm of communication and remote monitoring systems. Renowned for its reliability and efficiency, the SIM900A facilitates GSM (Global System for Mobile Communications) connectivity, enabling devices to transmit and receive data over cellular networks. Its compact design and low power consumption make it suitable for integration into a diverse range of projects, from IoT devices to security systems. Equipped with robust communication protocols, including SMS and GPRS (General Packet Radio Service), the SIM900A

empowers devices to send text messages, make voice calls, and establish internet connections, facilitating seamless remote communication. Its compatibility with standard AT commands simplifies integration and programming, allowing developers to leverage its functionalities with ease. Moreover, with support for multiple frequency bands, the SIM900A ensures global compatibility, making it an ideal choice for projects requiring worldwide connectivity. Overall, the GSM SIM900A module stands as a cornerstone in the development of efficient and reliable communication solutions, empowering devices with seamless cellular connectivity for diverse applications.

GPS NEO6m - The GPS NEO-6M module represents a pivotal component in modern navigation and tracking systems, renowned for its precision, reliability, and compact design. Leveraging cutting-edge Global Navigation Satellite System (GNSS) technology, the NEO-6M module is capable of receiving signals from multiple satellite constellations, including GPS (Global Positioning System) and GLONASS (Global Navigation Satellite System). Its advanced chipset enables rapid acquisition of satellite signals and accurate determination of position, velocity, and time data. With support for various communication interfaces such as UART, SPI, and I2C, the NEO-6M module seamlessly integrates into diverse applications, ranging from vehicle navigation systems and asset tracking devices to unmanned aerial vehicles (UAVs) and personal navigation devices. Its low power consumption and high sensitivity make it ideal for battery-powered applications, ensuring prolonged operational endurance without compromising performance. Overall, the GPS NEO-6M module stands as a cornerstone technology in the realm of satellite-based navigation and positioning, empowering a myriad of innovative solutions across industries worldwide.

16x2 LCD Display - The HD44780 controller powers this 16x2 LCD display, which acts as the system's user interface. It presents information in two lines, each with sixteen characters that are simple and succinct. For user awareness, the display's capacity to present data in real-time, such as coordinates and alerts, is essential. The text is clear and readable thanks to its 5x7 pixel matrix for each character. The display is suitable for a variety of situations and operates consistently between 0°C and 50°C. Visibility is improved in various lighting settings with an adjustable backlight and contrast. The 4 or 8-bit parallel interface of the LCD provides the Arduino with various connecting options. It is compatible with normal system power requirements and operates on a standard 5V power supply. The ease of use of this display is essential for prompt and simple involvement in emergency scenarios.

POWER SUPPLY - Lithium-ion cells, with their high energy density and lightweight design, have emerged as a popular choice for powering various electronic devices, ranging from smartphones to electric vehicles. Operating at a nominal voltage of 3.7 volts, these cells offer a reliable and long-lasting power source. However, to ensure compatibility with devices requiring lower voltage levels, such as microcontrollers or sensors, a voltage regulator is often employed. The voltage regulator serves as a crucial component in managing the output voltage, maintaining a stable and consistent supply within the specified range, regardless of fluctuations in the input voltage from the lithium-ion cell. By regulating the voltage to the desired level, typically 5 volts for many electronic applications, the voltage regulator safeguards sensitive components from potential damage due to overvoltage while optimizing the efficiency and performance of the system. This combination of lithium-ion cells and voltage regulators exemplifies a versatile power solution capable of meeting the diverse energy requirements of modern electronic devices with precision and reliability.

BUZZER - A buzzer is an electronic device commonly used to produce audible alerts or signals in various applications. It typically consists of an electromechanical component that generates sound when an electrical current passes through it. Buzzer sounds can range from simple beeps to more complex tones, depending on the design and purpose of the device. They are widely employed in alarm systems, notification devices, and electronic gadgets to indicate events or draw attention to specific situations. Buzzer circuits can be activated manually, automatically triggered by sensors, or controlled by electronic circuits. The versatility and simplicity of buzzers make them indispensable in scenarios where audible alerts are essential for communication or safety, such as in security systems, industrial machinery, and consumer electronics.

4. WORKING PRINCIPLE

The women and child security system are a sophisticated safety framework that relies on the seamless integration of multiple components. The Arduino Nano acts as the central processing unit, orchestrating the collaborative functioning of various modules. The GPS Neo 6M module continually captures precise location coordinates, ensuring real-time tracking of the device. The panic button, enhanced with variable resistance, empowers users to initiate an emergency signal with adjustable sensitivity levels. The Arduino processes input data from both the GPS module and the panic button, determining the appropriate conditions to trigger alerts. In critical situations, the GSM SIM900A module takes center stage, dispatching SMS alerts to preconfigured contacts, complete with the current GPS coordinates. The LCD 16x2 display serves as an intuitive interface, conveying essential information like location data and overall system status. Simultaneously, the activation of a buzzer provides an audible alert to attract attention in emergency scenarios where immediate communication via SMS might not be

feasible. The power system, featuring a 12V battery supply and a 7805-voltage regulator, ensures stable and regulated power distribution across the system, with the capacitor contributing to overall power stability. In essence, this comprehensive system, through its continuous monitoring, dynamic alerting, and user interaction features, is meticulously designed to bolster the safety and security of women and children, with the added assurance of an audible alert through the buzzer.
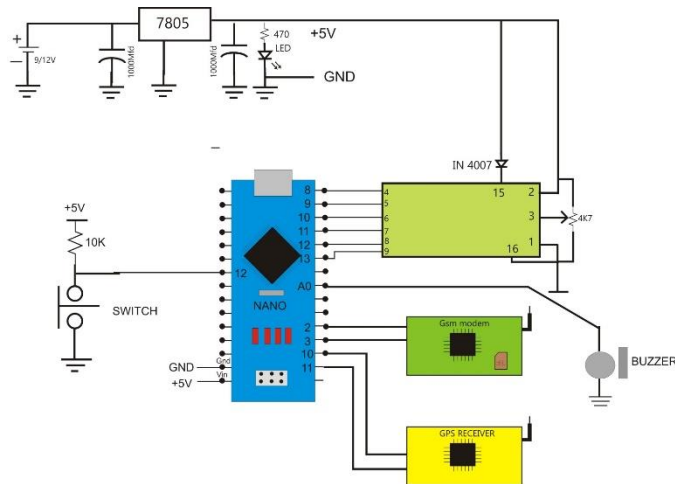

Figure 2: Circuit Diagram

Figure 3: Project Diagram

Figure 4: Result

5. RESULT

The implemented security system, centered around an Arduino Nano, seamlessly coordinates multiple components to deliver a robust safety solution. Upon activation, the system combines the functionalities of the GPS Neo 6M module and the panic button, allowing users to trigger an emergency alert. The Arduino processes the input data, and in critical situations, the GSM SIM900A module springs into action, sending a succinct SMS alert to pre-registered mobile numbers. This alert not only contains the real-time location coordinates, expressed as latitude and longitude, courtesy of the GPS module but also incorporates an audible component through the activation of a buzzer. The buzzer emits a distinctive beep sound, serving as an additional layer of attention-grabbing alert, ensuring that users are promptly informed of the emergency situation. This integrated approach, combining SMS alerts with precise location data and an audible buzzer alert, provides a comprehensive and effective means to enhance the security of individuals, delivering both visual and auditory cues for a rapid response.
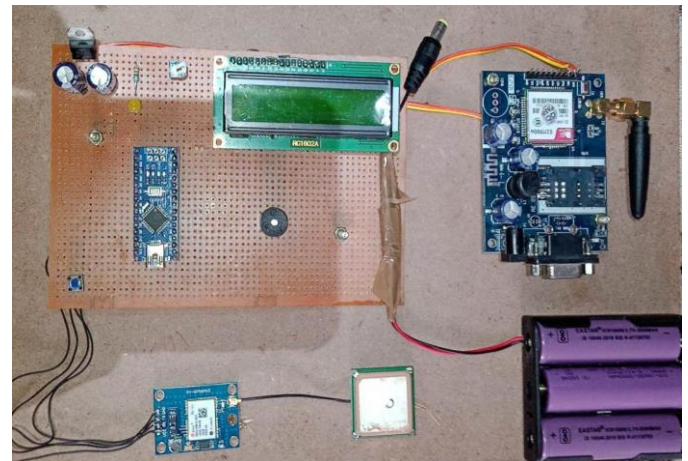
6. FUTURE SCOPE

Looking into the future, the women and child security system project presents exciting prospects for advancement and expansion. Integration with camera technology for image capture and live video recording adds a visual dimension to the security measures, enhancing surveillance capabilities. The system's adaptability can extend to interfacing with smartphones or mobile devices, providing users with convenient remote access and control. Furthermore, exploring connectivity with vehicles equipped with airbag systems could extend the safety net beyond physical spaces. To bolster security further, incorporating Motion Detector Technology could offer an additional layer of vigilance, enabling the system to detect and respond to suspicious movements. These innovative enhancements not only broaden the system's applicability but also contribute to a more comprehensive and adaptive security solution for women and children. Continued research and development in these directions hold the potential to elevate the system's effectiveness in addressing evolving security challenges.

7. CONCLUSION

In conclusion, the women and child security system, with its amalgamation of Arduino Nano, GPS Neo 6M, GSM SIM900A, and a panic button, establishes a robust safety infrastructure. The system efficiently processes data to trigger SMS alerts with real-time location coordinates while concurrently activating a buzzer for audible alerts. This comprehensive approach, combining precise information dissemination and attention-grabbing auditory cues, underscores the system's efficacy in enhancing the security and response mechanisms for the safeguarding of women and children.

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