

IoT and GSM Based Child Abduction Rescue Device

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Abstract

Women and children nowadays face a variety of difficulties, including sexual assault. Such acts of violence will undoubtedly have a significant impact on the lives of the victims. It also has an impact on their health and psychological well-being. These acts of violence are becoming more common by the day. Even youngsters at schools are kidnapped and molested. We live in a culture where a nine-month-old female child is not safe; the youngster was abducted, raped, and finally murdered. Witnessing such acts of violence against children motivates us to take action to ensure the protection of women and children. As a result, in this project, we intend to present a gadget that will serve as a tool for providing security and ensuring the safety of children and women. To transmit notifications and current position of children to various cellphone numbers in their contact list, a microcontroller, GSM, and GPS module are utilized. Furthermore, this initiative will serve as a safety precaution by temporarily incapacitating the opponents. This effort will assist us in rescuing countless youngsters from the nefarious elements of society. This child detection technology will help to ensure the safety of children, allowing parents to feel more comfortable letting their children out in public.

Keywords: GSM, GPS, Microcontroller, Children, Security.

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I. INTRODUCTION

The creation of this concept is primarily motivated by the issue of missing children. Missing children are no longer an unusual occurrence at shopping malls. Parents must pay extra attention to children aged three to four years old in order to restrict their movements. To avoid the occurrence of missing children at the shopping mall, parents must be mindful of their children. This is because leaving a youngster alone increases the chance of it being lost or kidnapped. As a result, this initiative was created and implemented to assist youngsters. Children in modern India endure societal issues and are frequently victims of abuse and violent crimes, according to a global survey done by Thomson Reuters, which ranks India as the "fourth most dangerous country" in the world among the G20 countries. This project focuses on a security system that is entirely meant to provide protection and security to youngsters in order for them to never feel powerless when confronted with societal issues.

The goal of this project is to create a system that allows the Global Positioning System (GPS) to be used in a variety of situations. The Global Positioning System (GPS) is a satellite navigation and positioning system that can deliver location and timing information throughout the world without relying on time or weather. The news of missing children is frequently published in the media.

Parents may not be able to keep a constant eye on their children, especially when they leave the house. This may lead the youngster to get distracted, and they may become lost or misdirected as a result. This kid monitoring system was created to assist parents and guardians in ensuring the safety of their children, particularly when they are out in public. This gadget will take the place of the traditional technique of monitoring children's safety in public places. It is critical to employ this child surveillance technique in order to avoid unfavorable outcomes. This is why this project for children's safety was created.

II. RELATED WORKS

[1] Shaista Khanam and Trupti Shah presented a fingerprint-based algorithm for women's protection. This study takes a comprehensive look at women's safety. For gadget activation, electric shock generating circuit, GSM and GPS module for alerting and position tracking, a fingerprint is required. If there is any unwanted things (wet or dust) in the finger, it is difficult to insert it in the fingerprint module in an emergency, and recognition is impossible. The fingerprint module will not be employed in the proposed system to prevent this problem.

[2] A mechanism for the safety and protection of women was invented by Naeemul Islam, Md. Anisuzzaman, Sikder Sunbeam Islam, Mohammed Rabiul Hossain, Abuja Muhammad Mohammad Obaidullah. Three push buttons are used to define the different sorts of accident victims. A PIC16F887A microcontroller is utilized to control the entire system. Because it is a 40-pin IC, the gadget grows in size, making it difficult for women and children to carry all of the time.

[3] An algorithm for women empowerment was presented by Sharifa Rania Mahmud, Jannatul Maowa, and Ferry Wahyu Wibowo. This document addresses violence against women as well as many women's health concerns. It's a software-based system. In the case of molestation, the victim's smartphone's application will automatically place an emergency call to the designated contacts. This is only possible if the smartphone's GPS is activated, and if it isn't, the project's negative is the time it takes to switch on the GPS.

[4] Anand Jatti, Madhvi Kannan, Alisha RM, Vijayalakshmi P, and Shrestha Sinha created a wearable device that relies on physiological inputs such as galvanic skin resistance and body temperature. Data is simultaneously monitored and analyzed utilizing a cloud platform and MATLAB. If there is a sudden change in a physiological parameter, the parents will be notified. However, body temperature can alter for a variety of causes. As a result, using body temperature as a criteria while designing a gadget for women's safety is unethical.

[5] An intelligent system for women and children was created by Sunil K Punjabi, Suvarna Chaur, Ujwala Ravale, and Deepti Reddy. A pressure switch is used in this system. When they feel threatened, she must squeeze the switch, after which an alert will be issued to the parents, followed by a phone call. If the call goes unanswered, it will be sent to a neighboring police station.

[6] M. Kavitha and V. Sivachidambaramanathan presented an IoT-based device for women's self-defense. A few bio sensors are utilized in this system to detect the user's physical changes. If any irregularities are identified on women, an alert will be issued to the guardian as per the device's preprogrammed settings.

[7] A survey on women's safety was produced by R. Pavithra and S. Karthikeyan. This software assists women in locating and assisting them in emergency situations. It assists in determining the precise location of the individual and sending SMS to the parents.

[8] A rescue mechanism for women's safety was devised by Madhura Mahajan, KTV Reddy, and Manita Rajput. It is a simpler safety option that may be accomplished by pushing a button and sending out notifications to the individual's immediate surroundings.

[9] A smart foot gadget for women's safety was invented by Nandita Viswanath, Naga Vaishnavi Pakyala, and G. Muneeswari. This smart gadget will be attached to the user's footwear. A Bluetooth alarm will be sent if the foot has been touched four times behind the others.

III. PROPOSED METHOD

In the present system, an emergency reaction scenario recognition app named VithU was introduced to ensure children's safety in any situation. VithU is an emergency app that begins sending out alarm messages every 2 minutes to your contacts that you enter into the app as chosen recipients or guardians after you press the power button on your smartphone two times consecutively. According to the message "I'm in peril. I require assistance. Please keep an eye on my whereabouts." Every two minutes, the receiver will receive a link to your location that will update their location. You'll also get updates on the crime scene in India, as well as a "Suggestions Feed" option that gives you safety tips in an emergency. For precise indoor locating and effective people guiding, Internet of Things (IoT) localization technologies such as RFID tags/readers or Bluetooth Low Energy (BLE) iBeacon devices can be used. iBeacon devices with BLE broadcasting and nearby smart phones with BLE scanning, in particular, may work together to gather mobile users' current positions on a regular basis and collaboratively follow the trajectories of moving objects. Automatic Queue Time Estimation, Unobtrusive Privacy Permission Recommendation, Fine-Grained Air Quality Monitoring, and Peer-to-Peer Navigation are just a few of the innovative crowd-sourced sensing applications and systems that have been created. Due to a network issue, there is less security; Door lock breaking is not implemented.

We present a children monitoring and finding framework in this research that uses GSM and GPS geolocation to detect holding-up behaviors and locate missing children. The project's ultimate goal is to develop an IoT-based smart security and safety system for women and children. This idea focuses on a security system that is entirely meant to provide protection and security to women in order for them to never feel powerless when confronted with societal issues. The Arduino uno microcontroller is used to interface with peripherals. The notice and position are sent through SIM 900 GSM and GPS. She must push the button in the event of an

emergency; the GPS application is used to track the child's whereabouts and communicate it to parents and the nearest police station using GSM technology. On the IOT server, the location of missing children will be updated.

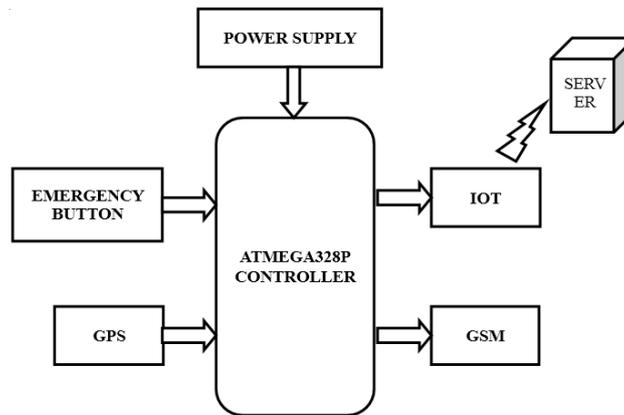


Fig.1. Proposed sytem Block Diagram

IV. MATERIALS AND METHODS

1.ARDUINO UNO

Arduino is an open-source electronics platform that uses simple hardware and software to make it easy to use. Arduino can read inputs such as light on a sensor, a finger on a button, or a Twitter tweet and convert them to outputs such as turning on an LED or starting a motor. These Arduino microcontrollers are simple to use and provide a pleasant user experience. Arduino boards are totally open-source, allowing users to create them on their own and customize them to meet their own needs. Those Arduinos that require significant amounts of different types, such as UNO, MEGA, and others, can use the Arduino UNO table. Along these lines, the UNO board will appear.



Fig.2. ARDUINO UNO

2. GLOBAL POSITIONING SYSTEM (GPS)

The Global Positioning System (GPS) is a satellite-based navigation system that gives position and time information in all weather circumstances anyplace on or near the Earth when four or more GPS satellites are visible. Military, civic, and commercial customers all across the world rely on the system for crucial capabilities. The system was built by the United States government, which maintains it and makes it freely available to anybody with a GPS receiver.



Fig.3. GPS

GPS technology may be divided into three categories, according to The Aerospace Corporation and Trimble: Control Segment: Consists of 5 ground stations across the world that control the operational health of the satellites by providing orbital corrections and clock updates. User Segment: Comprises a variety of GPS receivers ranging in complexity and sophistication. This is the part that most people are familiar with; examples include a car's navigation system or a mobile phone's GPS unit. When three GPS satellites triangulate and measure the distance to the receiver and compare the data, GPS receivers can determine their location. The time to the receiver is measured by a fourth satellite. To calculate the position, data from all four satellites is combined. The dependability and accuracy of GPS data depends on the complexity of the GPS receiver.

3. GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM)

The acronym GSM stands for Global System for Mobile Communications. It is a European Telecommunications Standards Institute (ETSI) standard that depicts specifications for second generation (2G) cell frameworks used by mobile phones. A modem is a device that regulates and demodulates upgrades as needed to satisfy the fundamental requirements of correspondence. It modifies a critical transport banner to encode unambiguous data into modernized data, as well as demodulates such a transporter standard when it becomes obsolete. A GSM Modem is an apparatus that modulates and demodulates GSM signals, in this instance 2G signals. SIMCOM SIM900 is the modem that is being utilized. It's a Tri-band GSM/GPRS Modem, as the name implies, and it operates on three frequencies (EGSM 900 MHz, DCS 1800 MHz and PCS1900 MHz). EGSM 900MHz and DCS 1800MHz are the standard operating frequencies. If you live in Europe or Asia and use a cellphone, your phone is almost certainly equipped with GSM technology. GSM (Global System for Mobile Communication) is an acronym for Global System for Mobile Communication. It is a digital cellular technology that allows mobile voice and data services to be sent. In the early 1970s, Bell Laboratories developed a cell-based mobile radio technology that became GSM. GSM stands for Global System for Mobile Communications, which was founded in 1982 with the goal of developing a single European mobile phone standard. GSM is a circuit-switched system with eight 25 kHz time slots for each 200 kHz channel. In most areas of the globe, GSM uses the 900 MHz and 1800 MHz mobile communication frequencies. GSM operates in the 850 MHz and 1900 MHz bands in the United States.

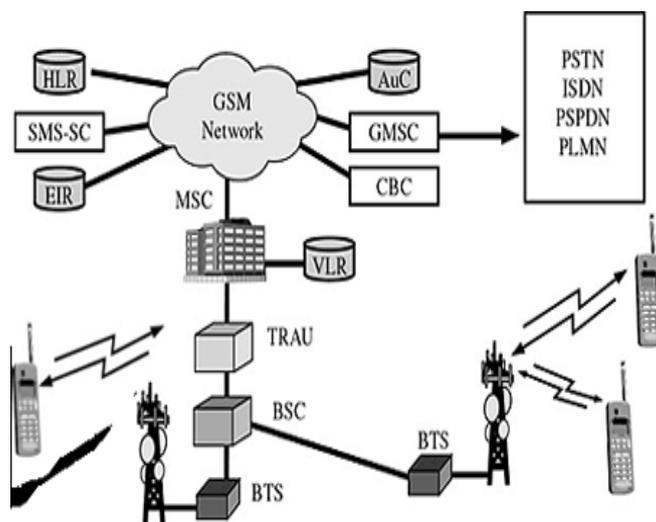


Fig.4. GSM Network

GSM has a market share of more than 70% of all digital cellular customers in the globe. GSM transmits signals using a narrowband Time Division Multiple Access (TDMA) mechanism, and it was designed using digital technology. It can handle data speeds ranging from 64 kbps to 120 Mbps. GSM now serves over one billion mobile customers in over 210 countries across the world. GSM offers basic to sophisticated voice and data services, as well as roaming. The ability to use your GSM phone number on another GSM network is known as roaming.

4. NODEMCU

The Wi-Fi counterpart of an Ethernet module is the NodeMCU. It combines the functions of a Wi-Fi network and a station with the capabilities of a microcontroller. The NodeMCU is a very strong tool for Wi-Fi networking because of these qualities. It can operate as an access point and/or station, and also host a web server and access the internet for data retrieval and uploading. The information is updated automatically in IoT for future references.



Fig.5. IOT Module

6. EXPERIMENTS/RESULTS/DISCUSSION

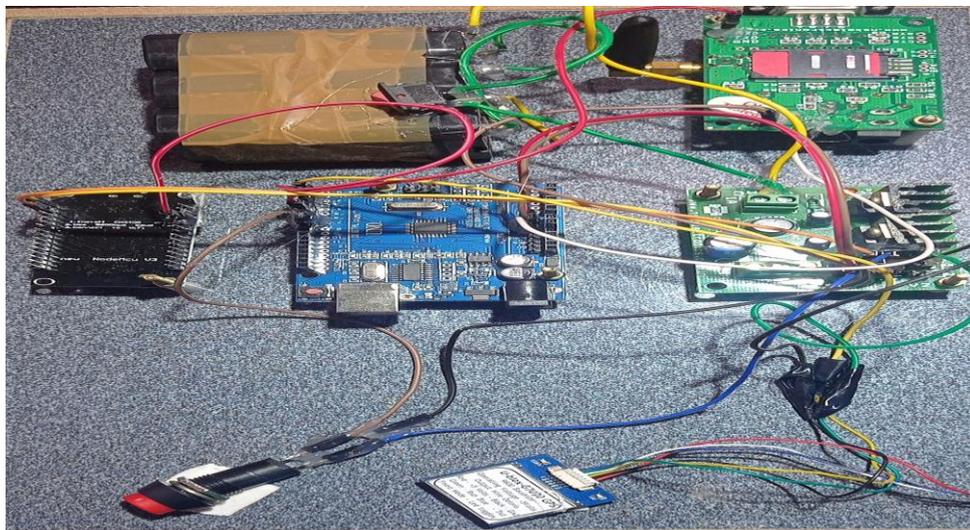


Fig.6. Project Module

V. CONCLUSION

The suggested structure will address basic difficulties that have previously been addressed by children and will illuminate them with innovatively sound equipment and ideas. While the general population may change for the better, having the power to be self-governing, confident, and really free may go hand in hand with having the best device. This framework has the potential to alleviate the fear that every child in the country has for his or her safety and well-being. Not just women, but also children, are sexually harassed nowadays. A mechanism has been presented in this work to guarantee security and assure their safety. Many researchers have worked in this field and created a variety of technologies. This study proposes a self-defense gadget based on

existing technologies, with new features added to make it more secure. The core design idea and functionality, as well as the desired consequences, are described in this article.

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