IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

WOMEN SAFETY DEVICE WITH GPS TRACKING ALERTS

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Abstract
Women's safety plays a very vital role now a days due to rising crimes against women. To help resolve this issue we propose a GPS based women's safety system that has dual security feature. The proposed system consists of a dual alert that is buzzer and message is sent through GSM. This system can be turned on by a woman in case she even thinks she would be in trouble. This Project presents a women safety detection system using GPS and GSM modems. The system can be interconnected with the alarm system and alert the neighbors. 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. A GSM modem is interfaced to the MCU. The GSM modem sends an SMS to the predefined mobile number. When a woman is in danger and in need of self-defense then she can press the switch, which is allotted to her. By pressing the switch, the entire system will be activated then immediately a SMS will be sent to concern person with location using GSM and GPS.

KEYWORDS: Application, Emergency, GPS Tracker, Security, Sensors,*Emergency Button*,Etc.

INTRODUCTION

The proposed concept is to build a safety device which will generate an emergency alarm and send a message to the user's friend or family. This will also help women or concerned during her trouble and keep others alert. By this process location tracking becomes easy.[1][4]
"848 Indian Women Are Harassed, Raped, and Killed Every Day!!" according to statistics. So, to properly combat this, we developed an approach in which women can self-manage any uncertain event. A day when the media will broadcast more of women's success rather than harassment, that will be a feat achievement![1][2][4]
For a well-groomed 21st century, self-protection became a priority which can be achieved with the help of user-friendly safety device provided with GPS tracking and alert.[1][4]
Our emergency kit is provided with a main switch since by pressing it, the battery will supply required voltage to the preprogrammed controller and the components that are directly connected to Arduino uno microcontroller such as GSM, GPS, LCD Display will start working accordingly. Hence, the proposed device interfaced with IOT will be continuously communicating with Smartphones.

LITERATURE SURVEY

GPS-EQUIPPED SMART WATCH WITH VOICE RECOGNITION: -

One proposed solution involves a GPS-equipped smartwatch equipped with voice recognition technology, an electric shock generating module, and screaming alarm modules. The smartwatch incorporates three sensors—a temperature sensor, a pulserate sensor, and a motion sensor. This comprehensive system enables real-time monitoring and can identify

when a woman is in a dangerous scenario. By leveraging technology for location tracking and health monitoring, the system facilitates prompt and appropriate action to ensure women's safety.

SEURITY SYSTEMWITH MULTIPLE MODULES: -

Another recommendation focuses on a security system that integrates various modules for robust safety measures. The system comprises the GSM shield (SIM900A), Atmega328 board, Arduino board, GPS (GYGPS6MV2) module, screaming alarm (ADR 9600), pressure sensor, and power supply unit. By combining these components, the system aims to provide comprehensive security precautions for women. The diverse set of modules enhances the system's capabilities, offering a multifaceted approach to women's safety.

“FEMME” DEVICEWITH BLUETOOTH SYNCRONIZATION: -

The "FEMME" device introduces a unique approach by utilizing an ARM controller and synchronizing with a smartphone via Bluetooth. This device can be triggered independently It also features a hidden camera detector, providing additional layers of security. The user-friendly design enhances accessibility, making it a practical option for women seeking reliable safety solutions.

“SURAKSHA” DEVICEWITH VOICE ACTIVATIONAND FORCESENSORS: -

The "SURAKSHA" device employs three activation methods—voice, switch, and shock. Notably, the device automatically locks when not in use to prevent unnecessary signals. It can be activated by a voice command, force sensors that trigger when thrown by force, or a simple press of the switch during distress. The combination of these activation methods ensures versatility and responsiveness in various situations.

WEARABLE SENSOR NODESWITH SOLAR ENERGYHARVESTING: -

This study introduces wearable sensor nodes equipped with solar energy harvesting capabilities. The system incorporates multiple sensors to monitor an individual's health data. Additionally, a single online application is developed to track the data collected by sensor nodes. The integration of solar energy harvesting adds sustainability to the wearable system, ensuring prolonged functionality without frequent battery replacements. In conclusion, these innovative safety devices showcase the diverse approaches and technological advancements in ensuring women's safety. From smartwatches with comprehensive sensor arrays to devices with voice activation and solar-powered wearables, these solutions contribute to creating a safer environment for women. The multi functionality, integration of advanced technologies, and user-friendly designs collectively represent

METHODOLOGY

Awomen’s safety device with GPS tracking and alert features can be designed as a compact, wearable accessory, like a ring or bracelet, for convenience and ease of use. Discreet yet powerful, it enables users to access personal security tools anytime.

The device would include GPS tracking for real-time location sharing, ensuring that pre-selected contacts or emergency services can monitor the user’s whereabouts. This feature allows trusted individuals to know exactly where the user is, enhancing overall safety.

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A hidden Push button can trigger silent alerts, activating real-time audio or video recording. The recordings are securely stored in the cloud, serving as evidence if needed. Silent alerts help users discreetly signal for help without alerting potential threats.The device would integrate with a mobile app for live tracking and customizable alert settings. Other features, such as an audible alarm or LED flashes, can help deter attackers by attracting attention.

To enhance reliability, the device would include a low-power mode and solar charging, allowing for extended battery life. Additional functionalities, like fitness tracking, encourage daily use and make the device a natural part of the wearer's routine. This combination of features creates a comprehensive solution, offering women an effective, accessible tool for safety and peace of mind.

BLOCK DIAGRAM

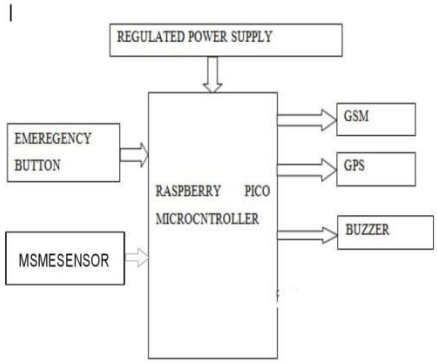

Fig 1: Circuit Diagram of Women Safety Device with GPS Tracking Alerts.

HARDWARE KIT: -

Fig 2: Hard ware kit of Women Safety Device with GPS Tracking Alerts.

SOFTWARE DESCRIPTION: -

Arduino - Installation

We were prepared to learn how to set up the Arduino IDE after studying about the major components of the Arduino UNO board. We'll be prepared to upload our application to the Arduino board after we discover this. The hardware kit for wireless Women Safety Device with GPS Tracking Alertsin Fig. 2.

In order to enable the board to receive the program through a USB cable, we need to first set up the Arduino IDE on our computer.

Fig 3: USB Cable

Step 1 –An Arduino board (you can select your own board) and a USB cord are prerequisites. For the Arduino UNO, Duemilanove, Nano, Mega 2560, or Diecimila, a normal USB cable (A plug to B plug) is required; this is the same type of cable that you would use to connect a USB.

Step 2: Download Arduino IDE software.

You're able to The Arduino Official Website offers many versions of the Arduino IDE that can be downloaded to a computer or an external power source. It is necessary to ensure that an Arduino Diecimila is set up to draw power from the USB connection. The website served as the power source. You have to choose software that works with the operating system you have (Windows, iOS, or Linux). Once the file download is finished, it gets unzipped.

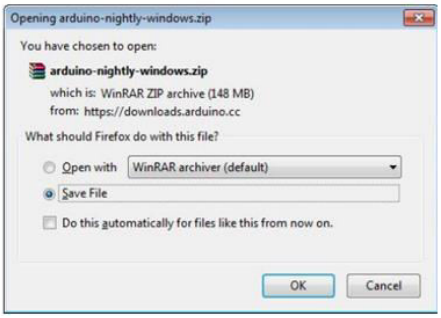

Fig 4:Download Arduino IDE software.

Step 3 − Power up your board.

The Arduino Mega, Duemilanove, Nano, and Uno all automatically draw power from an external power source or via a USB connection to the computer. Make sure the Arduino Diecimila is set up to take power from the USB connection if you're using one. A jumper, which is a little plastic component that slides onto two of the three pins between the power and USB connectors, was used to pick the power source. Verify if it is on the two pins that are nearest to the USB port.

The current method is a coin-based mobile charging system in which customers place coins in coin slots to begin charging their gadgets. Users should always have an appropriate number of coins in their-hands. Paying for a charging service may be done easily and conveniently and the cumbersome nature of this method for consumers to constantly have the appropriate number of coins is one of its drawbacks.

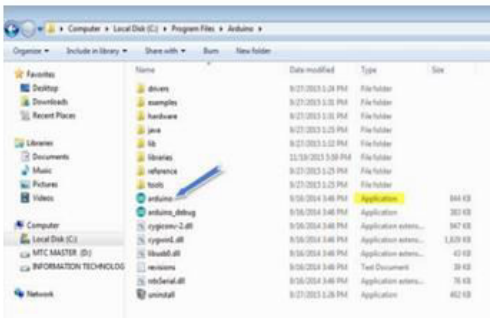

Fig 5:Power up your board.

Step4−Launch Arduino IDE.

The foldergets unzipped once the Arduino IDE software has been downloaded. An application icon with an indefinite label (application.exe) can be found inside the folder. To launch the IDE, double-click on the icon.

Step 5 −Opening the initial project.

Following the software's launch, you have two choices:

· Start a fresh project.

· Launch a working example of a project.

Choose File → New to start a new project. You can choose File → Example → Basics → Blink to view an existing project example.

Step 6 − Select your Arduino board.

Toavoid any error while uploading your program to the board, it is necessary to select the correct Arduino board name, which matches the board connected to the computer. Fig 8 shows the basic Arduino.

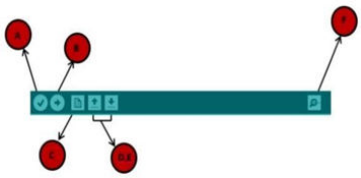

Fig 6: Basic Arduino

Step 7 − Input your serial port selection.

It selects the Arduino board's serial device. Select the Serial Port menu under Tools. COM3 or above is most likely the port (COM1 and COM2 are typically designated for serial hardware ports). You may check by unplugging your Arduino board and reopening the menu; the Arduino board should be the one whose entry vanishes. After reconnecting the board, choose the serial port.[11]

Step 8 − Upload the program to your board.

We need to run through the purpose of each symbol that shows up in the Arduino IDE toolbar before we go over how to upload our script to the board.

A − is utilized in order to detect compilation errors.

B: This is where an Arduino board program is uploaded.

− The shortcut to start a fresh sketch.

D: This key opens an example sketch right away.

Applied to store your drawing.

To send and receive serial data to and from the board, an F-Series monitor is utilized.

Click the "Upload" button in the surroundings now. After a little while, the RX and TX LEDs on the board will start to flash. The status bar displays the message "Done uploading" if the upload is successful.

GPS (GLOBAL POSITIONING SYSTEM):

GPS Module (Neo-6M): It stands for Global Positioning System, which gives the current date, time, longitude, latitude, altitude, speed, and travel direction / heading among and other data of any device. It can be interfaced with normal 5V Microcontrollers with the help of the inbuilt 3V-5V converter unit. It consists of 4 Pins are 5V, TX, RX, and GND. This standalone 5V GPS Module does not require external components. It consists of internal RTC Back up battery and can be directly connected to USART of the microcontroller.[1][2][4]

GSM (SIM900A):

GSM which stands for Global System forMobile Communication is a digital mobile telephony system. SIM900 can fit almost all the space requirements in the M2M application with dimensions of 24mm x 24mm x 3 mm. This is a GSM/GPRS-compatible Quad-band cell phone, which works on a frequency of 850/900/1800/1900MHz and can be used not only to access the Internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMSs and calls. The processor is also in charge of a SIM card which needs to be attached to the outer wall of the module. The module works on voltage between 3.4 and 4.5 V. [1][4][7]

MEMS SENSOR:

An accelerometer is a micro-electromechanical device that measures acceleration forces. These forces may be static, like the constant force of gravity pulling at our feet, or they could be dynamic - caused by moving or vibrating the accelerometer. There are many types of accelerometers developed and reported in the literature. The vast majority is based on piezoelectric crystals, but they are too big and too clumsy. People tried to develop something smaller, that could increase applicability and started searching in the field of microelectronics. They developed MEMS (micro electromechanical systems) accelerometers. [1][4]

PUSH BUTTON:

The reset button is a button that when clicked, will clear all of the fields in the micro controller, and executes the instructions from the starting address.

A switch placed between the digital input and ground will short the digital input to ground when it is pressed. This means the voltage seen at the input will be high when the switch is open and low when the switch is closed.

Adding hardware photo of our kit which is click in the phone.

WORKING: -

This paper clearly uses two main modules of GSM and a microcontroller. Whenever the user presses the panic button in the encoder the microcontroller pin gets low and it starts to allow

GPS to send location information to GSM. Through the AT commands all those messages reach the microcontroller. Using AT Commands GSMwill send the help message along with latitude and longitude values to the registered mobile numbers in the code. Normally, we prefer two mobile numbers to be registered in the code. If necessary, we can use mobile numbers up to four, ifweneed to use more than four it takes time to send message

RESULTS

The Women Safety Device with GPS Tracking and Alerts aims to enhance personal security by providing an easy-to-use emergency response tool. This device enables users to send real-time location alerts to selected contacts or emergency services, facilitating quick assistance. With a simple activation method, like pressing a button or using a voice command, the device is designed to be accessible under stressful conditions. It offers accurate GPS tracking, regularly updating the user's location with minimal delay. Additionally, it is engineered for battery efficiency, lasting 12–24 hours on standby to ensure reliable use over extended periods. Compact and durable, the device is wearable and resilient to daily wear, making it practical for various environments. Testing shows positive feedback on its usability, alert speed, and accuracy, underscoring its potential to be a dependable safety solution for women.
Fig. 4: The finished output kit.

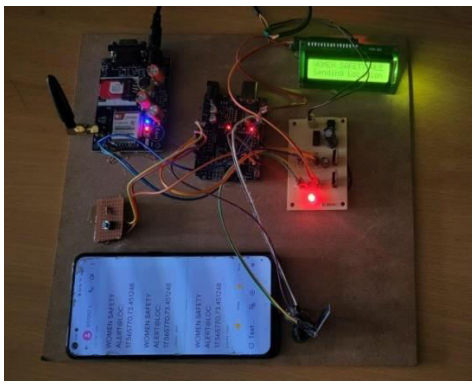

Fig 7: Final Output Kit

CONCLUSION

Now a day's being safe and secure is very important for women. Our main aim of this project is to design a system which is very easy to handle and provide personal security system. This design will deal with most of the critical issues faced by women and will help them to be secure. Existing systems provide the safety by using the internet connection through apps in the android mobiles and tracking the vehicle this type of security mechanism is very difficult to use. The proposed system will provide the latitude and longitude values of location of the victim which can further be trackedusing Google maps. By using this system, we can reduce the crime rate against the women. Women's security is a critical issue in current situation. The crimes can be reduced with the help of real time implementation of our proposed system. [1][2][4][9]

FUTURE SCOPE

In this paper we can further implement Beam Gun in Japanize an electronic light gun. This can be used for the defense purpose. And pepper spray can be used. Wearable technology, wearable's, fashionable technology, wearable devices, tech togs, or fashion electronics are

clothing and accessories incorporating computer and advanced electronic technologies. The designs often incorporate practical functions and features.

We can Integrate this project into wallets a handbag that women Carry, by using Nano size materials the kit size gets reduced

In future the wireless GPS module & push button Carrying Kit can be avoided.

REFERENCES

1. Prof. Basavaraj Chougula, Archana Naik, Monika Monu, Priya Patil and Priyanka Das SMART GIRLS' SECURITY SYSTEM Web Site: www.ijaiem.org Email: editor@ijaiem.org Volume 3, Issue 4, April 2021.
2. Poonam Bhilare1, Akshay Mohite 2, Dhanashri Kamble3, Swapnil Makode4 and Rasika Kahane5 Women Employee Security System using GPS And GSM
3. Prof. Rupali Mahajan, SAYALI A. LAVHATE, SAYALEE P. WAGHMARE, PRERANA K. PINGALE A Survey on Women's Security System Using GPS and GSM NTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN COMPUTER AND COMMUNICATION ENGINEERING volume 5 issue 2 feb-2022.
4. Wankhade, H., Mahajan, S., & Gop Narayan, S. P. (2022). Women's Safety Device with GPS Tracking and Alert. International Journal for Research in Applied Science and Engineering Technology, 10(8), 1177–1183. https://doi.org/10.22214/ijraset.2022.46386
5. Khanam, S., & Shah, T. (2019). Self Defence Device with GSM alert and GPS tracking with fingerprint verification for women safety. 2019 3rd International Conference on Electronics, Communication and Aerospace Technology (ICECA). https://doi.org/10.1109/iceca.2019.8822114.
6. Monisha, D. G., Monisha, M., Pavithra, G., & Subhashini, R. (2016). Women Safety Device and Application-FEMME. Indian Journal of Science and Technology, 9(10). https://doi.org/10.17485/ijst/2016/v9i10/88898
7. Patil, –. S. S. (2024). Women Safety Device Using IOT. INTERANTIONAL JOURNAL OF SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT, 08(03), 1–9. https://doi.org/10.55041/ijsrem29139
8. Tiwari, A., Tiwari, G., Kumar, A., Verma, H., & Awasthi, K. K. (2020). "KAVACH" - WOMEN SAFETY DEVICE WITH GPS TRACKING AND SMS ALERT. Journal of Emerging Technologies and Innovative Research, 7(7), 1954–1957. https://www.jetir.org/papers/JETIR2007248.pdf
9. Sen, T., Dutta, A., Singh, S., & Kumar, V. N. (2019). Protect – Implementation of an IoT based 3 –Way Women Safety Device. 2019 3rd International Conference on Electronics, Communicationand Aerospace Technology (ICECA). https://doi.org/10.1109/iceca.2019.8821913
10. Prakash, N., Udayakumar, E., Kumareshan, N., & Gowrishankar, R. (2020). GSM-Based Design and Implementation of Women Safety Device Using Internet of Things. In Advances in intelligent systems and computing (pp. 169–176). https://doi.org/10.1007/978-981-15-5285-4_16

ISSN PRINT 2319 1775 Online 2320 7876
 UGC CARE Listed (Group -I) Journal Volume 11, Iss 11, 2022

11. Arshad, S. R. '., Mansor, Z., Maharum, S. M. M., & Ahmad, I. (2022). Women Safety Device with Real-Time Monitoring. In Advanced structured materials (pp. 273–282). https://doi.org/10.1007/978-3-030-92964-0_27
12. Arshad, S. R. '., Mansor, Z., Maharum, S. M. M., & Ahmad, I. (2022). Women Safety Device with Real-Time Monitoring. In Advanced structured materials (pp. 273–282). https://doi.org/10.1007/978-3-030-92964-0_27
13. Ranganadha, A. (2020). Women Safety Device with GPS Tracking and Alerts. In Lecture notes in electrical engineering (pp. 797–805). https://doi.org/10.1007/978-981-15-2256-7_74
14. Sisa Nalli, D. N. (2024). Women Safety Device with GPS Tracking and Alerts. International Journal for Research in Applied Science and Engineering Technology, 12(1), 94–100. https://doi.org/10.22214/ijraset.2024.57870
15. Smitha, M., Dharshini, P., Priyatharsini, A., Devi, M. P., & Devi, M. P. (2019). Women safety device using GPS tracking and alert. International Journal of Recent Trends in Engineering and Research, 5(Special Issue 1), 492–495. https://doi.org/10.23883/ijrter.conf.20190322.063.ivbqi