

Design and Implementation of Women Auspice System with GPS Tracking

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Abstract: - The project, named "Design and Implementation of Women Auspice System with GPS Tracking," aims to enhance the safety of women. Despite many advances in technology, many women still feel worried about their safety. Despite the rapid advancement of technology in the 21st century, many women still feel unsafe venturing outside alone during late hours or at unusual times. While technology has evolved, concerns over their safety persist. The solution proposed here is a wearable device, something like a small gadget that can be carried easily or worn, which doesn't rely on having a smart phone or being able to operate one in a stressful moment. This project aims to create a small, easy-to-use device that women can carry with them to feel safer when they're out and about. If they feel threatened, they can quickly press a button to call for help, without needing to fumble with a phone.

Keywords- *Arduino UNO R3, GPS, GSM, Buzzer, Safety.*

I. Introduction

This project aims to enhance women's safety by creating a wearable device that provides complete security, allowing them to move freely anytime, anywhere. It consists of components like GSM, GPS, Buzzer, Power supply, and Arduino UNO R3. Despite women facing various safety concerns, including body-shaming and harassment, this project prioritizes addressing these issues. While there are existing mobile apps for women's safety, not all women have access to or are comfortable with using smartphones. Hence, the project utilizes Arduino UNO R3 to receive GPS signals, sending the current location via GSM to pre-set emergency contacts. Additionally, a buzzer alerts nearby individuals for immediate assistance, potentially saving the wearer from dangerous situations.

This project is particularly crucial in today's world, where women face increasing challenges and threats to their safety, regardless of their age or occupation. Despite the progress

women have made in various fields, safety remains a significant concern. The wearable safety system addresses this gap by leveraging technology to provide real-time protection. By combining GPS tracking with GSM communication, it ensures that help can be summoned swiftly in case of an emergency. The inclusion of a buzzer adds an extra layer of security, alerting people in the vicinity to come to the wearer's aid. This innovative solution empowers women to feel safer and more confident when navigating public spaces, ultimately contributing to their overall well-being and freedom of movement.

II. EXISTING SYSTEM

This system is designed to send SMS alerts containing the user's location to their relatives or a helpline number in case of emergency. It utilizes a GPS module to instantly determine the user's location. Additionally, three push buttons are integrated to specify the type of emergency the user is experiencing. When the user encounters trouble, they can press one of these buttons, prompting the microcontroller to send an SMS to a designated phone number. The system continuously tracks the user's location until it is turned off upon rescue.

III. PROPOSED SYSTEM

The project, named "DESIGN and IMPLEMENTATION of WOMEN AUSPICE SYSTEM with GPS TRACKING," centers on enhancing women's safety through a wearable device. Despite the existence of numerous smart phone apps designed to protect women, the reality is that during moments of danger, it might be difficult for them to use their phones. This wearable device is equipped with essential features such

as GPS for location tracking, GSM for communication without a phone, a dedicated power source, an emergency button, and a buzzer to draw attention. This system aims to provide a reliable safety solution for women, ensuring they have immediate assistance and alert capabilities at their fingertips without the need to interact with a smart phone.

IV. METHODOLOGY

In this project, the Arduino UNO R3 microcontroller serves as the brain, boasting a versatile array of 40 pins for seamless integration with various components. Two push buttons are strategically employed: the first acts as a master switch, initiating or halting the safety protocol, while the second triggers an audible distress signal through a buzzer. Upon activation, the microcontroller springs to life, enabling auxiliary modules such as GPS and GSM.

Once powered on, the GSM module takes center stage, transmitting the precise geographic coordinates of the endangered individual to predefined contacts. These contacts typically include emergency services, family members, and nearby neighbors accompanied by latitude and longitude data, swiftly alerts recipients to the distressing situation.

In tandem with the GPS-GSM functionality, the second push button provides an additional layer of safety. When pressed, it activates the buzzer, emitting a loud and attention-grabbing noise. This serves to alert nearby individuals to the urgent situation, potentially expediting assistance.

This comprehensive system not only provides a means of rapid communication during emergencies but also leverages auditory signals to garner swift aid from the surrounding community. Thus, it stands as a proactive solution to safeguard individuals in vulnerable situations.

V. FLOW CHART

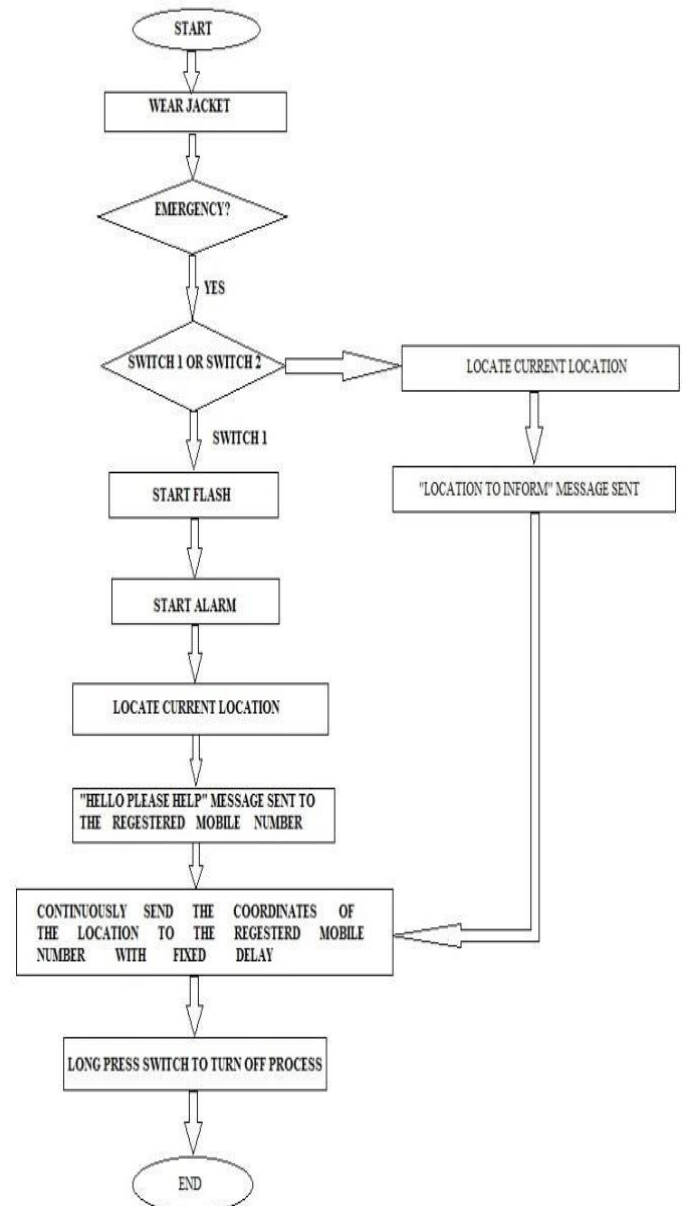


Figure 1 Flowchart of Women Auspice system

VI. BLOCK DIAGRAM

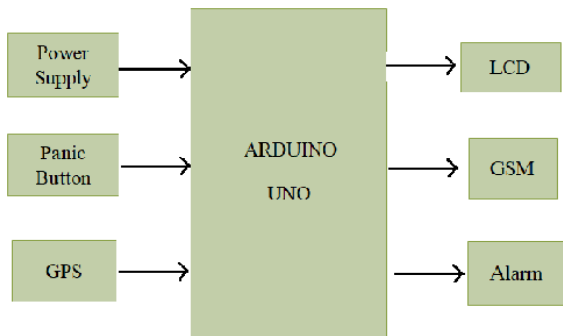


Figure 2. Block Diagram

ADVANTAGES

- **Enhanced Security Measures:** The system employs advanced security protocols, providing a comprehensive shield against potential risks and dangers.
- **Comprehensive Monitoring:** It diligently oversees every potential hazard and threat, ensuring proactive identification and mitigation.
- **Instant Mobile Alerts:** Users receive prompt notifications on their mobile devices, keeping them informed remotely about any pertinent information.
- **Flexibility in Mobile Number Management:** The system allows for seamless updates to mobile contact information, ensuring adaptability and convenience for users at any given time.

Applications

- **Emergency Alerts:** Alerting authorities and trusted contacts in distress situations.
- **Location Tracking:** Sharing real-time location with friends or family for added safety.
- **Safe Routes:** Providing information on safe travel routes and areas to avoid.
- **Self-Defence Training:** Offering tutorials and guidance on self-defence techniques.
- **Resources Directory:** Access to helplines, support groups, and legal aid services.
- **Incident Reporting:** Allowing users to report incidents anonymously or seek help discreetly.

- **Companion Features:** Virtual companionship during walks or commutes, with automatic alerts if the user feels unsafe.
- **Education and Awareness:** Providing educational content on safety tips, rights, and resources for women.
- **Community Support:** Connecting users with nearby support networks or groups for solidarity and assistance.
- **Integration with Authorities:** Direct links to emergency services and law enforcement for immediate assistance.

VII. HARDWARE DETAILS

The ATmega16 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC Architecture. The ATmega16 is a versatile 40-pin microcontroller with significant memory capabilities. It features 16 KB of programmable flash memory, allowing users to store and execute program code. Additionally, it possesses 1 KB of static RAM, providing temporary data storage during program execution, and 512 Bytes of EEPROM, offering non-volatile memory for critical data storage that persists even when the power is off. The microcontroller is equipped with 32 I/O (input/output) ports. These ports facilitate communication with external devices and sensors, enabling the microcontroller to receive inputs and produce outputs. The flexibility of having multiple ports allows for efficient interfacing with various components, enhancing the overall functionality and adaptability of the ATmega16 in embedded systems and microcontroller-based projects. The Pin is saved in the EEPROM. This Pin could be reset when required. If the Pin is wrong then the user is prompted to enter the Pin again (3 Chances given). If the entered Pin is correct then for 2-way verification, an OTP is sent on the user's device via. The HC-05 Bluetooth Module has 6 pins- EN, Vcc, GND, TX, RX and State supporting both Master and Slave configurations. This flexibility makes it suitable for various applications where reliable wireless data transfer is essential. The typical range for Bluetooth communication with the HC-05 is around 30 meters or less.

For user input, a Keypad 4x4 is utilized to load numeric data into the microcontroller. This keypad consists of 16 buttons arranged in a 4x4 array, forming four lines and four columns. It requires only one port pin to read a digital input into the microcontroller. The matrix arrangement of the keypad efficiently reduces the pin count, making it practical for scenarios with numerous digital inputs.

In summary, the combination of the HC-05 Bluetooth Module, LCD screen, and Keypad 4x4 provides a comprehensive solution for wireless communication, visual output, and user input in microcontroller-based systems.

Can be a physical keypad or a touchscreen display. OTP Generator: The component responsible for generating one-time passwords based on algorithms and time-sensitive parameters. This could be implemented within the microcontroller or as a separate module. Sensor s: Various sensors like door/window sensors and motion detectors to monitor the status of entry points and detect any unauthorized access attempts. Communication Module: Enables communication between the microcontroller and external devices, such as a Wi-Fi or Bluetooth module for remote access and monitoring. Power Supply: Provides the necessary the complexity of the system, and the desired features. Integration of secure communication protocols and encryption mechanisms is essential to ensure the overall security of the home security system.

VIII. DESCRIPTION OF SOFTWARE

The Software that compiles Embedded C code utilizes an Embedded C compiler to generate a hex file.. Then simulation software is used to test the prepared code (fig. 2). After successful testing of prepared Embedded C code. Then another software is used to burn the hex file inside the MCU [10]. The microcontroller-based OTP Lock for an integrated home security system is a software solution designed to enhance security by incorporating a one-time password (OTP) mechanism. This software enables communication between the microcontroller and various components of the home security system to ensure secure access. Overall, the microcontroller-based OTP Lock software provides a robust and adaptable solution for integrated home security, ensuring a high level of protection against unauthorized access. OTP Generation: The software generates unique, time-sensitive OTPs for user authentication, adding an extra layer of security. User Management: Allows administrators to add, modify, or remove users, assigning unique credentials for access control. Integration with Sensors: Interfaces with sensors like door/window sensors, motion detectors, ensuring real-time status updates. Mobile App Integration: Provides the ability to manage and monitor the lock system remotely through a dedicated mobile application. Logging and Reporting: Records access attempts, successful or otherwise, providing a detailed log for security monitoring and analysis. 6. Emergency Access: Implements a backup mechanism or emergency codes for authorized personnel to access the property in case of

system malfunctions. Secure Communication: Utilizes encryption protocols to secure communication

IX. SIMULATION RESULT

Feature	Integrated System	Manual System
Convenience	Integrated locks are more convenient because they can be opened and closed with a secured code i.e. OTP.	Manual locks necessitate that the user engage and disengage the lock mechanism by hand..
Security	These are more secure because they can be controlled through additional security features.	Manuel locks are vulnerable to being picked or breached making them less secure.
Maintenance	Requires regular maintenance.	Requires minimal maintenance.
Cost	More expensive because of their advanced technology.	Less expensive.

Table 1. Contrast between Integrated Locking Systems and Manual Locks.

Feature	Existing System	Proposed System
Lock Mechanism	Traditional key-based locks	Microcontroller controlled lock with OTP
Integration	Limited integration with other devices	Seamless integration with home automation systems

Emergency Access	Limited options	Provision for emergency access protocols
Remote Access	Limited or absent	Remote access and control through mobile apps
User Authentication	Key possession-based	OTP generation for each access attempt.

Table 2. Comparing of existing system with proposed system

SCHEMATIC DIAGRAM

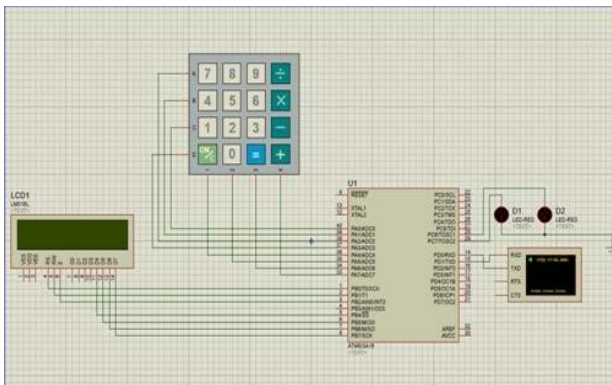


Figure 3. PROJECT SIMULATION

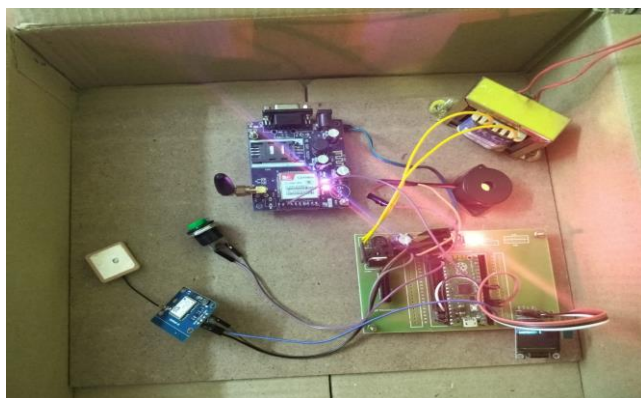


Fig 4 Output

CONCLUSION

The project aims to address the common issue of forgetting keys or accidentally getting locked out of one's home. In such situation, gaining access can be challenging. The proposed solution offers a keyless entry system to alleviate these concerns while enhancing security.

By implementing a keyless entry system, individuals can access their homes without the need for traditional keys. This is particularly beneficial in situations where keys are forgotten or misplaced. Additionally, the system provides a secure alternative to conventional locks, reducing the risk associated with physical keys being lost or stolen. Project likely incorporates advanced technologies such as electronic locks, password or PIN-based entry, or even biometric authentication for enhanced security. The integration of such features not only ensures convenient access but also enhances the overall safety of the home.

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In All Sincerity,

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