Electroshock Safety Handbag

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ABSTRACT

The Electroshock Safety Handbag is a personal security solution designed to enhance the safety and well-being of women in potentially dangerous situations. This device combines advanced technology with user-friendly features to provide real-time protection and assistance. Equipped with emergency alert functions, GPS tracking, and loud alarms, the device allows women to quickly notify authorities in times of distress. Compact and discreet, these bags are designed to be easily carried without hindering daily activities, offering peace of mind and empowering women to feel safer in their environments. With an emphasis on simplicity and reliability, the Shock-Activated Defense Bag serves as an essential tool for personal security, particularly in high-risk or unfamiliar settings. The Electroshock Safety Purse is a personal security accessory designed to protect women from potential threats by incorporating electroshock mechanism. In the event of an attempted theft or attack, the purse can deliver a non-lethal electric shock to deter the aggressor. The device is activated by switch, ensuring it only responds in dangerous situations. With a sleek, discreet design, this purse combines everyday functionality with advanced safety features. It offers peace of mind to users, particularly in high-risk environments, by providing an effective self-defense tool while remaining stylish and practical.

Keywords— Siren, Electric Shock, GPS, GSM, CAM

1. INTRODUCTION

The Women's safety is an important aspect of personal well-being, ensuring that women can live, work, and move freely in society without fear of harm or violence. Safety concerns for women can range from street harassment and domestic violence to more extreme threats like assault or abduction. As a result, personal safety measures have become increasingly essential for women in both public and private spaces. Women's safety involves a combination of awareness, prevention, and protection strategies. These can include self-defense training, awareness of potential dangers, and carrying personal safety devices designed to alert others or deter attackers. The built-in camera captures footage in case of an emergency, providing valuable evidence for law enforcement or loved ones. The SD card allows for easy storage and retrieval of recorded images and videos, ensuring crucial data is always accessible. Additionally, the GPS system enables precise location tracking, allowing authorities or emergency contacts to find the user quickly if needed. With GSM connectivity, the device can send immediate alerts via text or calls to predefined contacts or directly notify emergency services, ensuring a fast response in critical moments. The battery indicator lets the user know when the device is low on power, ensuring they are never caught without the necessary protection. For added security, the device includes a shock circuit at the handle, which can deliver a non-lethal shock to deter an attacker, offering a practical self-defense mechanism in a threatening situation. The device is designed to be discreet, lightweight, and easy to carry, combining everyday functionality with powerful safety features.

Our project mostly focuses on a security system that is entirely meant to keep women safe and secure, so they never feel

helpless. While confronted with such social issues The most powerful incentive for this initiative was the Delhi "Nirbhaya" case, which sparked outrage across the country. It was past time for us, the women, to make a change.
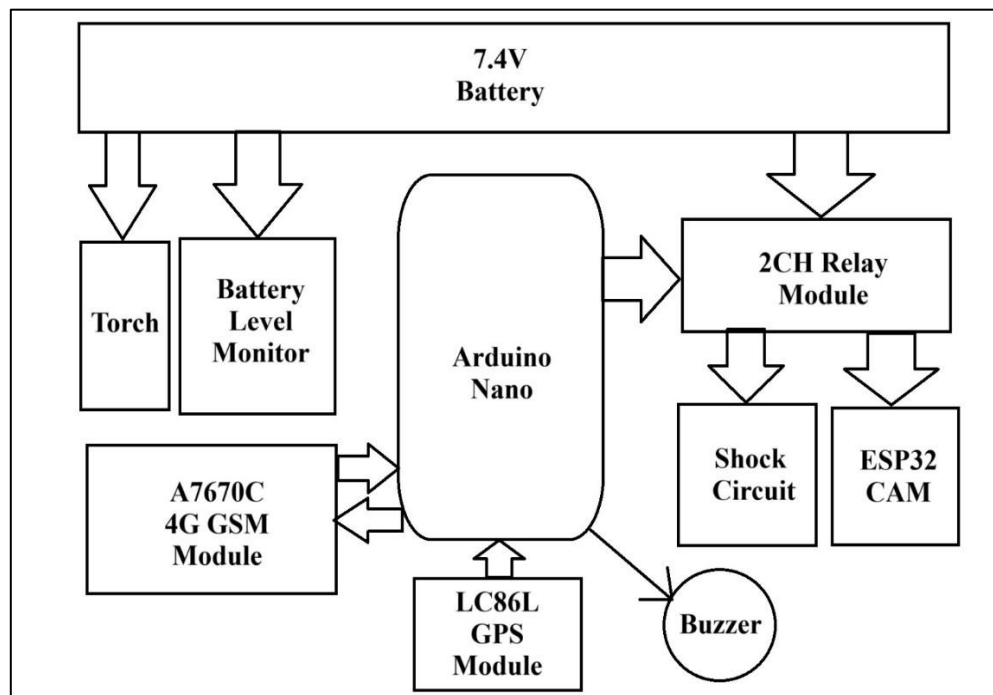
2. DESIGN METHODOLOGY AND IMPLEMENTATION

2.1 Required Hardware Components:

1. Buzzer/Siren
2. L86 GPS Module
3. GSM Module
4. Push Button
5. ESP32 CAM & SD Card
6. 7.4 Rechargeable Battery
7. Torch
8. Battery level Monitor
9. 2CH Relay Module
10. Arduino nano

2.2 Required Software Components:

Fig 1 – Block diagram of Shock-Activated Defense Bag

1. Coding Language for Arduino nano- Embedded C.
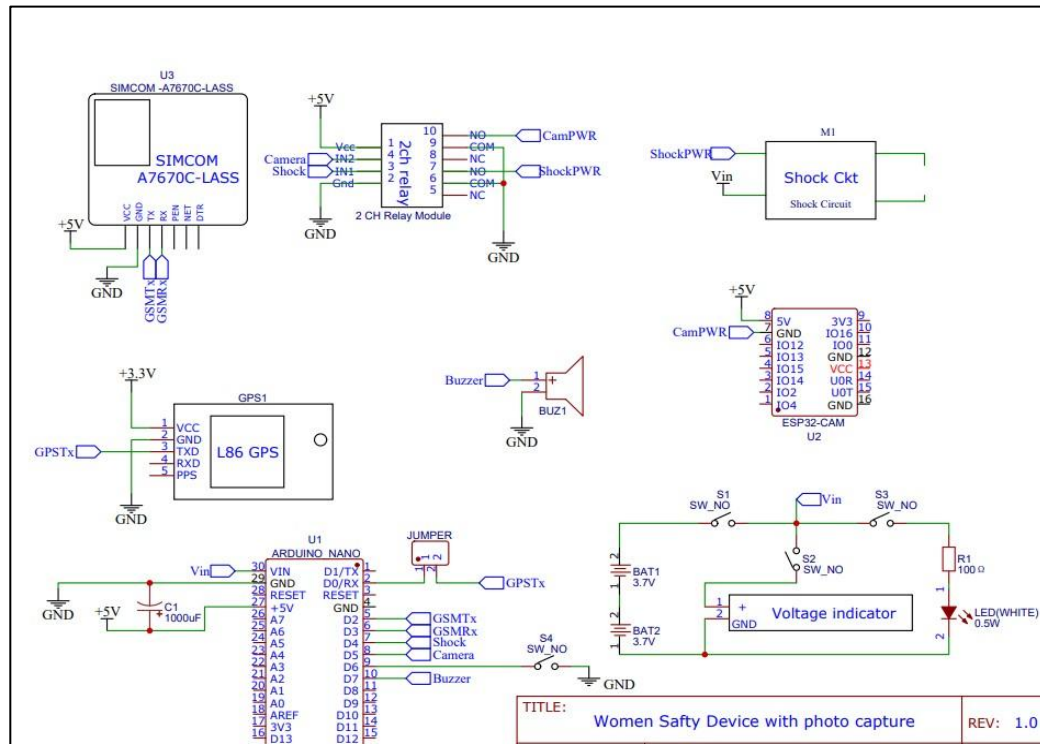
2.3 Block Diagram and Circuit Diagram

Fig 2 - Circuit diagram of Shock-Activated Defense Bag

2.4 Methodology

1. Power Supply Management

A 7.4V rechargeable battery is used to power the entire system.

The power is distributed to all modules via voltage regulators or buck converters to provide appropriate voltage levels (5V or 3.3V as required).

A battery level monitor continuously tracks the voltage and gives visual or data feedback, helping the user to recharge in time.

2. Central Control: Arduino Nano

An Arduino Nano is the central microcontroller unit, managing all inputs and outputs.

It controls the decision-making process, reads sensor values, and triggers specific modules based on emergency inputs.

3. Emergency Detection and Trigger

When the user presses an emergency panic button (or any other defined trigger), the Arduino activates multiple safety mechanisms:

Starts camera recording using the ESP32-CAM

Activates shock circuit via 2-channel relay

Sends GPS location via GSM

Sounds the buzzer for audible alert

Turns on a torch for visibility

4. Camera Module – ESP32-CAM

Upon trigger, the Arduino sends a signal to the ESP32-CAM, which starts capturing photos.

Data is stored on an onboard microSD card and streamed (if WiFi is enabled).

5. Electric Shock Circuit

A low-power electric shock module is triggered via one channel of the 2-channel relay.

It is used as a self-defense mechanism to deter physical threats.

The relay isolates control logic from high-voltage shock generation.

6. Location Tracking - LC86L GPS, - A7670C GSM Module

The GPS module continuously receives location coordinates (latitude and longitude).

The A7670C 4G GSM module is used to send emergency SMS containing the live GPS coordinates to pre-configured contacts.

GSM module is interfaced via UART and controlled with AT commands.

It ensures that even without internet access, help messages can be sent over cellular networks.
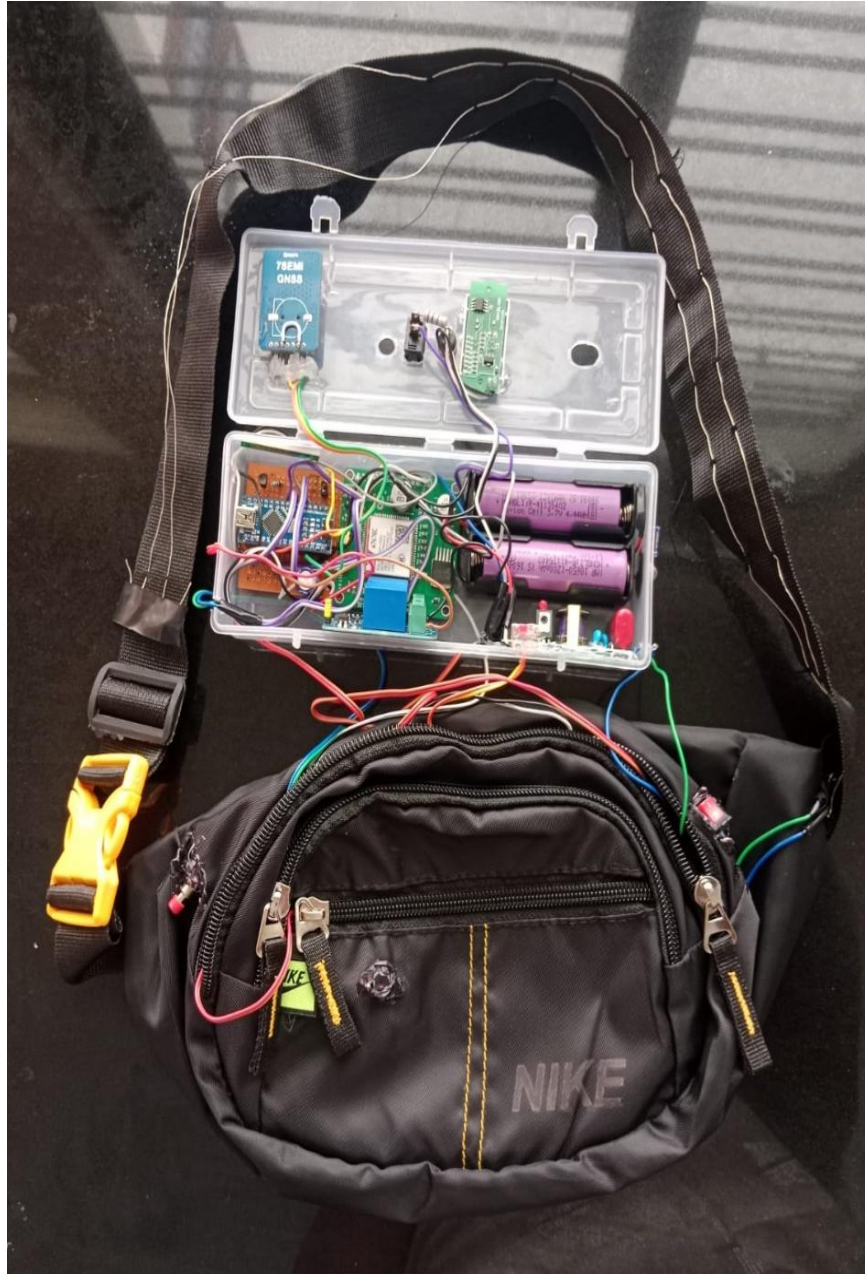
7. Alert System – Buzzer & Torch

A buzzer provides an immediate audio alert to attract attention.

A torchlight helps in low-light or nighttime conditions for visibility and deterrence.

Both are powered directly from the battery and controlled by the Arduino and switch.

2.5 Working

The Electroshock Safety Handbag is a microcontroller-based personal safety device integrated with multiple emergency features to ensure immediate response in threatening situations. It is powered by a rechargeable 7.4V battery and controlled by an Arduino Nano, which coordinates the operations of all modules. The system consists of an inbuilt camera, GPS and GSM modules, a shock circuit embedded in the belt, a torch (flashlight), a buzzer, and a battery level indicator. The device is operated using multiple switches, each designated for a specific function. Upon pressing the first switch, the Arduino activates the system and triggers the camera module, which instantly captures a photo and stores it on an SD card for evidence. When the second switch is pressed, the Arduino triggers a 2-channel relay, activating the shock circuit on the belt to defend against an attacker, and simultaneously powers the buzzer to alert nearby people. A third switch controls the torch, providing visibility in dark surroundings. The battery level indicator, connected to an analog input on the Arduino, constantly monitors the battery voltage and can alert the user when the battery is low. Meanwhile, the LC86L GPS module continuously tracks the user's location, and in an emergency, the A7670C GSM module can be programmed to send the GPS coordinates via SMS to pre-defined emergency contacts. All modules are powered through regulated supply lines, and the system is designed for low power consumption. This technically robust implementation ensures that the safety bag functions effectively in real-life scenarios, offering quick activation, real-time location tracking, evidence capture, self-defense, and alerting capabilities, all in a portable and user-friendly format.

3. ACTUAL PROJECT

4. Key Benefits, Future Scope, Conclusion

4.1 Key Benefits

1. **Enhanced Personal Safety**: Equipped with an electric shock circuit, the bag provides immediate physical defense during emergencies.
2. **Real-Time Location Tracking:** The built-in GPS module enables accurate real-time tracking, helping rescuers locate the user quickly.
3. **Evidence Collection:** The inbuilt camera captures photos or videos at the time of the incident, which can serve as vital evidence.
4. Portable and User-Friendly: Compact design makes it easy to carry like a regular bag, while simple switches ensure ease of use.
5. **Psychological Comfort:** The combination of physical safety and technological support gives users the comfort of knowing they have resources at their disposal should a dangerous situation arise.

4.2 Future Scope

1. **Mobile App Integration:** The system can be integrated with a dedicated smartphone app to provide remote control, live GPS tracking, and real-time camera streaming.
2. **Voice Activation:** Implementing voice recognition can allow users to activate safety features hands-free in situations where pressing a switch is not possible.
3. **Health Monitoring:** Adding pulse and temperature sensors can help monitor the user's health and automatically send alerts if abnormal vitals are detected.
4. **Miniature Design:** The components can be further miniaturized for integration into regular handbags, jackets, or accessories for discreet safety.
5. **Cloud Storage and AI Analysis:** Images and GPS data can be uploaded to the cloud for storage and real-time analysis, enhancing evidence security and emergency handling.

4.3 Conclusion

In conclusion, the Electroshock Safety Handbag is a thoughtfully designed, technology-driven safety solution aimed at empowering women with immediate protection and communication tools during emergencies. By integrating essential components such as an inbuilt camera for evidence capture, GPS for real-time location tracking, GSM for emergency alerts, a shock circuit embedded in the belt for self-defense, a torch for visibility, and a battery level indicator for power monitoring, the bag functions as a comprehensive personal security system. The use of an Arduino Nano microcontroller ensures seamless coordination between all modules and enables precise control through multiple switches, allowing the user to activate specific functions as needed. The device not only helps deter potential threats but also aids in alerting family or authorities promptly with location details and evidence. Its compact design, ease of use, and low cost make it suitable for everyday use, while also offering great potential for future enhancements such as app integration, automatic activation, and wearable formats. Overall, our project successfully demonstrates how embedded systems technology can be effectively used to address real-life safety challenges, making it a meaningful step toward improving women's safety in modern society.

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