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Women Safety Device with Shock Taser and Location Tracking

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Abstract: ***This abstract provides an overview of a Women Safety Device. The safety and security of women continue to be a significant concern in modern society. To address this issue, we present a comprehensive Women Safety Device equipped with a Shock Taser and Location Tracking, implemented using the Arduino Uno microcontroller. The core functionalities of the proposed device include a shock taser for self- defense and a location tracking system to ensure quick response in case of emergencies. The shock taser is designed to deliver a non-lethal electric shock, acting as a deterrent against potential threats. The device utilizes high-voltage, low-current pulses generated by the Arduino Uno to create a safe and effective self-defense mechanism. Furthermore, the location tracking feature utilizes GPS and GSM technologies to continuously monitor the user's real-time position. The Arduino Uno gathers GPS data and transmits it via GSM to the predefined contacts. This allows authorized contacts, such as family members or authorities, to track the user's location and respond promptly to distress situations. By combining a shock taser for self-defense and a real-time location tracking system, this device contributes to a safer environment for women and provides peace of mind for both users and their loved ones.***
Keywords: Arduino Uno, Shock taser, GPS, GSM, self-defense

I. INTRODUCTION

The Women Safety Device integrates modern electronics, user-friendly interfaces, and compact design to create a versatile solution tailored to the challenges faced by women in various scenarios. By merging the elements of personal defense and location awareness, this device seeks to bridge the gap between personal safety and proactive response, ensuring that users can swiftly and effectively deal with emergencies while also alerting relevant parties about their situations.

This paper delves into the intricacies of the Women Safety Device with Shock Taser and Location Tracking using Arduino, highlighting its key components, operational mechanisms, and the tangible benefits it brings to personal security. Through the convergence of technology and safety, this device underscores a commitment to fostering safer communities and empowering individuals to embrace their daily lives with an added layer of protection The development of a women's safety device with shock taser and location tracking addresses the need for an innovative and reliable solution that enhances personal safety, provides peace of mind, and helps reduce instances of violence and harassment against women.

II. LITERATURE SURVEY

S. K Anisha, S. Chandana, J.J Teresa, S. Varma, M.N Thippeswamy the paper title as – "Women's Wearable security and safety device" - This is the safety device which uses GPS module and pi camera. The camera captures the images and uploads to a drive which will be helpful for facial recognition.

K. Tirupathaiah, P. Vyshnavi, M, M. Bhavani, S. Ajay Kumar, Mahesh Kumar, Juni Khayat the paper titled as – "Hiding Security System for Alone Women by Using GSM and GPS" - The paper presents a security system designed to safeguard the well-being of women when they are alone. An emergency push button is discreetly integrated into a jacket, enabling quick activation. The primary objective of this device is to notify the parents and the police of the woman's current location in case of an emergency. It utilizes a GPS system to track the victim's precise position and a GSM modem to transmit messages to pre-defined contacts.

Snehal Bhagwat, Meenakshi Funde, Ravindra Sona wane Shalaka Deore, Shubhangi Ingale the paper titled as – "Woman Safety and Alert System" -This paper introduces an approach to enhance women's security, offering a potential improvement over existing security method. The system is centered on the Arduino micro-controller and incorporates GPS, GSM, a wristwatch, a shockwave generator circuit, and an accelerometer to provide more robust security measures.

J. Sriram Pavan, Ch. Usha, Y. Lahari, U. Manisha, S. Navya Sri the paper titled as – "Women Safety Device with GPS Tracking and Alerts Using Arduino" - The paper presents a Women Safety Device with GPS Tracking and Alerts that can be linked to an alarm system to notify neighbors in case of emergencies.

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The system comprises a GPS receiver, an ARDUINO, and a GSM Modem. The GPS receiver gathers latitude and longitude coordinates from satellites, which are processed by ARDUINO.
This processed information is then transmitted to the user through the GSM modem. Notably, the system is designed to function in both online and offline modes. In either mode, local law enforcement or volunteers near the user's location can provide assistance when needed.

A. Outcome of Literature Survey

Today in this world the women are being kidnapped and harassed by physically strong people who can escape by the time authorities are alerted. Therefore, a means of defense system has to be added. So, to ensure safety and security of women this idea of smart device is built which not only has location tracking but also a shock taser for self-defense. This paper proposes the dangerous issues faced by the women and it will help in finding the culprit easily with help of high technologies. And it will be easy to implement in different areas for security and surveillance of women. This paper is all about providing safety to women on designing the smart device. This device helps to identify the critical situation of women.

III. PROPOSED WORK

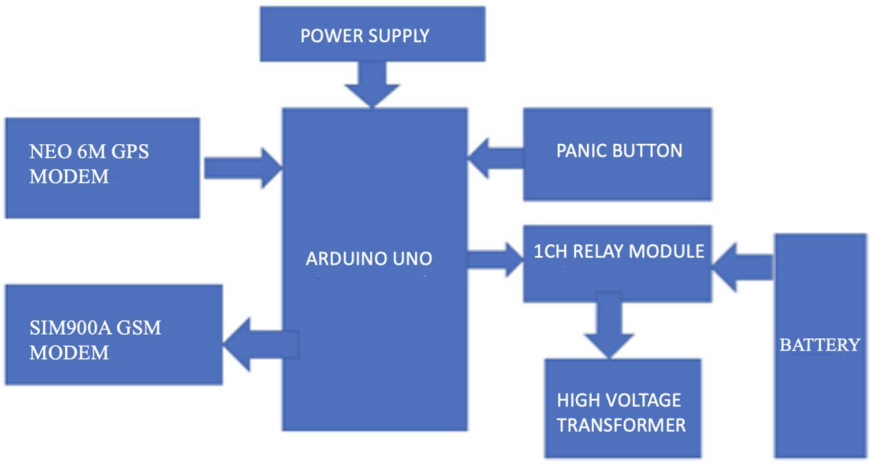


Figure 1. System Architecture

The Women Safety Device with Shock Taser and Location Tracking using Neo6M GPS, Arduino, relay module, and SIM900A GSM module offers an all-encompassing approach to improve personal safety.
The shock taser activated as intended upon user command, and the relay module triggered it under controlled conditions, showcasing the device's non-lethal self-defense capability. The Neo6M GPS module consistently acquired accurate location data, while the Arduino microcontroller efficiently processed it for real-time tracking.
Upon shock taser activation, the device communicated with the SIM900A GSM module, quickly sending an emergency alert SMS with the user's location to predefined contacts. In conclusion, the Women Safety Device with its shock taser, GPS, GSM module, and relay module shows great promise as a comprehensive safety solution, effectively combining shock activation, reliable tracking, and rapid communication to empower users and enhance personal safety. Its ongoing development holds the potential to make significant contributions to overall safety and security. Arduino UNO is an open-source platform, ideal for prototyping and education. It uses Arduino programming language to read inputs and create outputs, and it has expanded to support IoT and wearables. The UNO board is affordable, offers clear programming, and features an ATmega328 microcontroller, making it versatile for various projects.
The operation of the components within the Women Safety Device with Shock Taser and Location Tracking is described as follows:

1) *Arduino:* Functioning as the central processing unit of the system, the Arduino establishes communication with the GPS antenna and GSM modem. Its programmed task is to collect GPS data and execute subsequent actions.
2) *GPS Antenna:* The GPS antenna receives signals from orbiting satellites, acquiring precise asset location data, encompassing latitude, longitude, and altitude. This information is then forwarded to the Arduino for processing. The NEO 6M chip has four pins: TX, Rx, VCC, and Gnd.

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3) *GSM Modem:* Enabling data exchange between the system and a mobile device, the GSM modem utilizes the cellular network for real-time information transmission, including GPS coordinates. It can send SMS messages or establish a TCP/IP connection for data transfer.
4) *Relay:* Relays are electrical switches employed to control circuits using a low-power signal or to manage multiple circuits via a single signal. Historically, they served as amplifiers in long-distance telegraph systems, repeating and retransmitting signals.
5) *Taser:* The high-voltage transformer taser serves as the primary self-defense feature of the device. Its purpose is to temporarily immobilize potential attackers by delivering a high-voltage electric shock. It is a Boost step-up power module with a high voltage generator capable of producing an arc of 4kv.

The Women Safety Device with Shock Taser and Location Tracking is a comprehensive personal safety solution that seamlessly integrates multiple components. Upon powering up, the Arduino microcontroller initializes the Neo6M GPS for precise location data, the SIM900A GSM module for communication, and the relay for shock taser activation. When a user presses the designated button, the shock taser is armed, ready to fend off potential threats. In an emergency, another press of the button triggers the shock taser, while the Arduino simultaneously sends an emergency SMS with the user's GPS coordinates to predefined contacts. This allows for swift assistance and tracking.

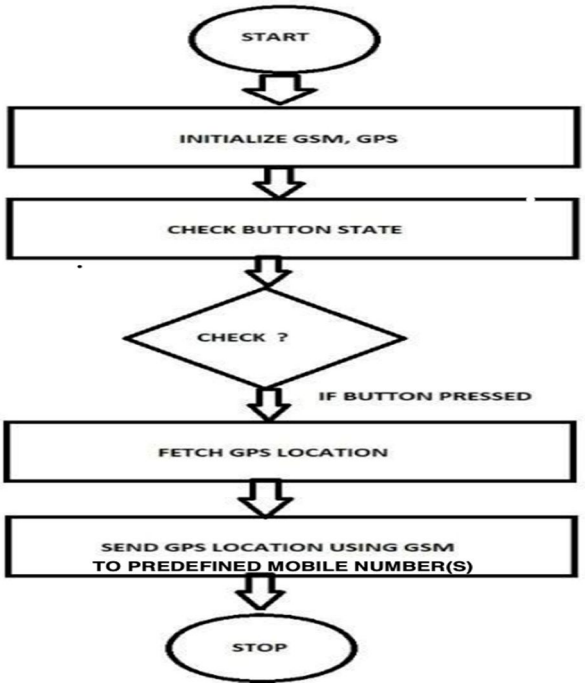


Figure 2 Flowchart

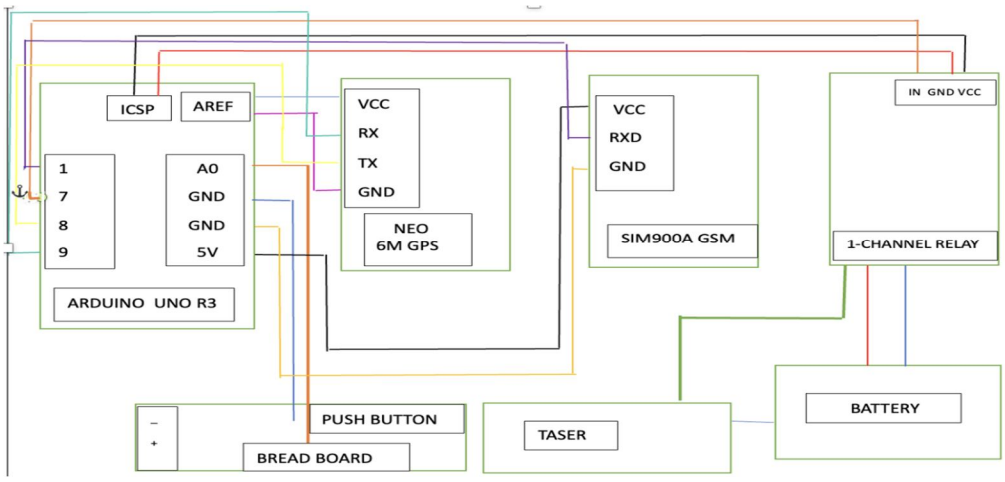


Figure 3 Circuit Diagram

Advantages:

1) Provides safety for women.
2) Ensures the security of children.
3) Safeguards the well-being of the elderly.
4) Offers assistance to individuals with physical disabilities.

IV. CONCLUSION AND FUTURE SCOPE

In conclusion, the fusion of location tracking and shock taser functionality within a women's safety device powered by Arduino represents a significant stride in enhancing personal security. This innovation not only empowers women with a formidable means of self-defense but also ensures their real-time location is readily accessible in case of an emergency. The amalgamation of technology and personal safety underscores a commitment to creating a safer environment for women. As technology continues to advance, the synergy of these features offers both peace of mind and tangible protection, exemplifying the potential for proactive solutions in addressing the critical issue of women's safety.

The future holds immense potential for the evolution of women's safety devices integrating location tracking and shock tasers with Arduino technology. further development can focus on enhancing the user experience by refining the ergonomics, size, and wearability of these devices. moreover, improved connectivity with law enforcement and emergency services, such as automated distress signal transmissions, can be explored. advancements in machine learning could enable predictive threat analysis, further fortifying women's safety. additionally, research into non-lethal, incapacitating technologies and multi-sensory alerts can provide comprehensive protection. as technology evolves, the scope for continuous innovation in women's safety devices remains promising, offering a safer future for all.

V. RESULTS

The Women Safety Device with Shock Taser and Location Tracking using Arduino, Neo6M GPS, SIM900A GSM module, and relay module exhibits promising results in providing a comprehensive safety solution. Its successful activation of the shock taser, reliable location tracking, and effective communication capabilities mark it as a valuable tool for empowering individuals to navigate their surroundings confidently. As the device evolves, it has the potential to make significant contributions to personal safety, thereby fostering a safer and more secure environment for all.

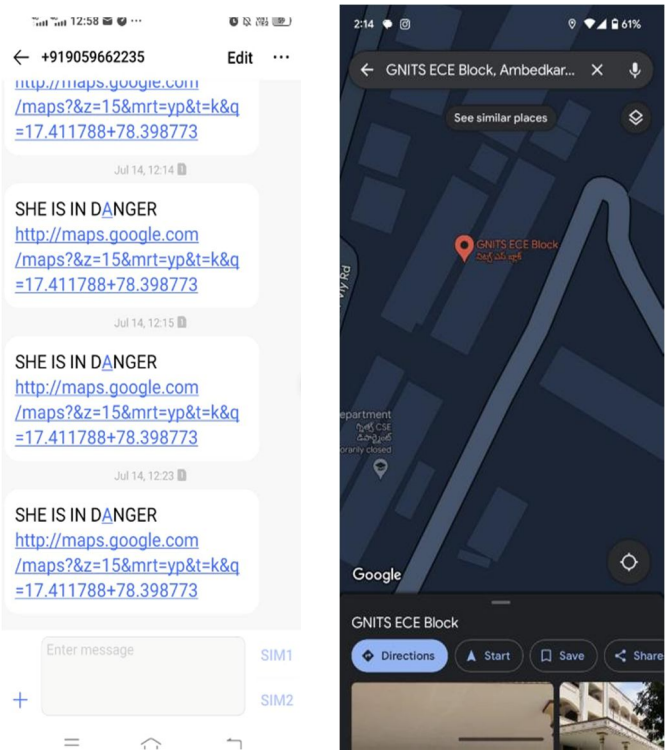


Figure 4. Emergency Alert Message and Location

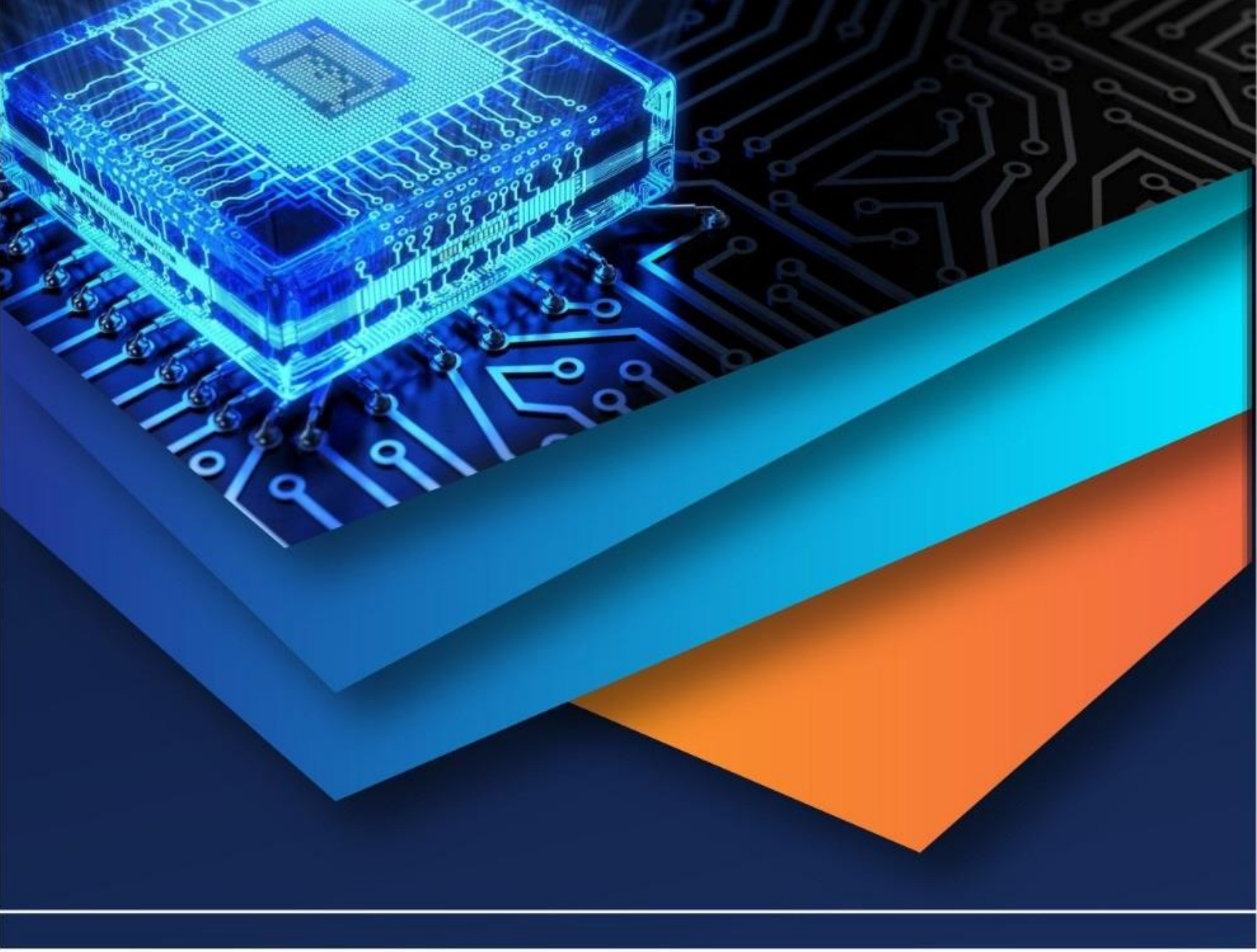
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