

## **SMART SELF DEFENCE FOR WOMENS SAFETY**

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### **ABSTRACT**

In recent years attacks and other violent crimes against women have been increasing . The number of female employees in companies and other fields is increasing, and as part of their daily routine, female employees are now required to travel at late nights , visit faraway and isolated locations. But the rapid increase in attacks, violent crimes, and current rash of attacks against women threatens the growth and mental health of women. There are more effective measures than defence for dealing with this growing abuse. It is necessary to come up with a security solution that gives women a sense of security. It is commonly stated that attacks make women unconscious. Therefore, there's a demand for simpler a safety solution that is easily triggered by GSM and RFID and that may immediately alert the victim's family members and close friends. The information

passes to an RFID reader, which connects to an Arduino microcontroller. The system can

be designed to function as a combination and lightweight device. A GSM network is used to send a "help" message to two specified contacts (parents and police).

## **KEYWORDS:**

Automatic messaging system, women's safety system, and current location.

## **INTRODUCTION**

The imperative to ensure the safety and well-being of women in society has spurred significant advancements in the realm of wearable technology and Internet of Things (IoT) solutions. In response to this pressing need, we propose the development of a sophisticated Wearable Device for Women's Safety utilizing IoT technology. This project integrates insights from a diverse array of

research studies and papers, each offering valuable perspectives and contributions to the overarching goal of enhancing women's safety.

Drawing upon the seminal work of Saravanan et al. (2019), who pioneered the development of a Wearable Device for Women's Safety using IoT, we build upon their foundational research to explore novel functionalities and design considerations[1]. Additionally, the comprehensive review conducted by Vijayakumar et al. (2018) provides a nuanced understanding of existing Smart Safety Systems for Women, offering insights into emerging trends and challenges in this domain[2]. Further enriching our understanding, Balachandar et al. (2020) present a novel concept of a Smart Necklace for Women's Safety, underscoring the importance of form factor and user acceptance in wearable safety devices[3]. Similarly, the work of Venkatraman et al. (2017) highlights the potential of IoT-based solutions in Women's Safety Systems, laying the groundwork for subsequent innovations in this field[4]. Recent advancements in IoT technology are showcased in the study by Priyadharshini et al. (2021), which explores the integration of wearable devices and IoT for women's safety, reflecting the evolving landscape of smart safety systems[5]. Meanwhile, the research conducted by Vignesh et al. (2019) presents a holistic approach to Women's Safety Systems, incorporating IoT and Android application development to enhance usability and functionality[6]. Moreover, Karthikeyan et al. (2018) delve into the convergence of IoT and cloud computing in the context of women's safety, highlighting the potential for scalable and robust solutions that leverage cloud infrastructure for data storage and analysis[7].

By synthesizing insights from these seminal studies and building upon their findings, our project endeavors to contribute to the ongoing discourse on women's safety by developing a Wearable Device for Women's Safety that leverages IoT technology to provide comprehensive protection and assistance in

threatening situations.

## **LITERATURE SURVEY**

(International Journal of Computer Applications): This study proposes an IoT-

1. **"Development of a Wearable Device for Women Safety Using IoT"** (International Journal of Advanced Research in Computer Science and Software Engineering): This study explores the development of a wearable device incorporating IoT technology to enhance women's safety. It investigates features such as GPS tracking, panic buttons, and real-time communication capabilities.

2. **"A Review on Smart Safety System for Women Using IoT"** (International Journal of Emerging Technology and Advanced Engineering): This review provides an overview of existing smart safety systems for women based on IoT technology. It examines various components and functionalities, including GPS tracking, GSM communication, and wearable devices, to identify trends and challenges.

3. **"Smart Necklace for Women Safety using IoT"** (International Journal of Scientific Research in Computer Science, Engineering, and Information Technology): This paper presents the design and implementation of a smart necklace equipped with IoT technology for women's safety. It discusses features such as location tracking, emergency alerts, and automatic distress calls to predefined contacts.

4. **"Women Safety System Using Internet of Things"** (International Research Journal of Engineering and Technology): This research explores the design and development of a women's safety system based on IoT technology. It investigates the integration of components like GPS, GSM, and accelerometers to detect and respond to potential threats in real-time.

5. **"An IoT-based Smart Safety System for Women using Wearable Devices"**

based smart safety system for women utilizing wearable devices. It examines the incorporation of sensors, GPS tracking, and mobile applications to provide comprehensive protection and support.

innovative IoT-based solutions.

## **PROPOSED SYATEM**

The proposed system is a Combact Device for Women's Safety, designed to provide comprehensive protection and assistance in threatening situations through the integration of Internet of Things (IoT) technology. The system consists of a wearable device equipped with various sensors, communication modules, and safety features, as well as companion software for data management and user interaction.

The proposed system Enhanced Protection: By leveraging IoT technology and advanced sensors, the system provides proactive protection and assistance in threatening situations, empowering women to navigate their surroundings with confidence. Swift Response: The system enables rapid detection of emergencies and immediate response, minimizing response times and increasing the likelihood of successful outcomes in critical situations. Ease of Use: With an intuitive user interface and seamless integration with mobile applications, the system is designed to be user-friendly and accessible to individuals of all technical backgrounds. Continuous Improvement: Through data collection and analysis, the system can identify patterns and trends in safety incidents, enabling ongoing refinement and optimization to better meet the evolving needs of users.

This overview outlines the key components, operation, and expected benefits of the proposed system, highlighting its potential to significantly improve women's safety through

## SYSTEM OVERVIEW

Fig 1: Block diagram of system overview

### WORKING

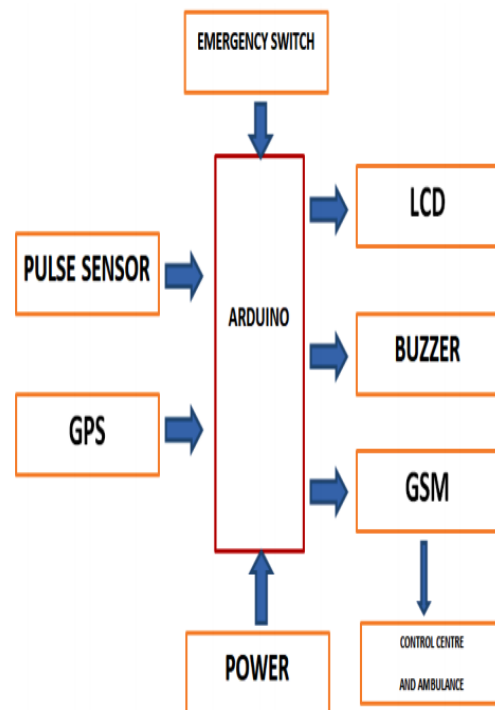
The Smart Self-Defense System for women's safety functions through a series of integrated processes and interactions between its various components. Here's an overview of how the project works:

#### Initialization

and Authentication: The system begins by initializing its components and conducting self-tests to ensure proper functioning. Users authenticate themselves using RFID tags or cards, granting access to the system's functionalities.

#### Real-time Monitoring:

Once activated, the system continuously monitors the user's surroundings using sensors such as accelerometers and gyroscopes. It analyzes data inputs to detect potential threats or abnormal activities, such as sudden movements, falls, or distress signals from the user.



**Location Tracking and GPS Integration:** The system employs a GPS module to track the user's location in real-time with high accuracy. It periodically updates the user's coordinates and stores the data for future reference or emergency situations.

**Threat Detection and Response:** Upon detecting a potential threat or triggering event, such as a sudden fall or physical assault, the system initiates a series of predefined responses. It activates the buzzer to emit loud and distinct sounds, attracting attention and deterring assailants. In critical situations, the system may activate the shocking device, delivering a non-lethal electric shock to incapacitate attackers temporarily and provide the user with an opportunity to escape.

**Communication and Alert Mechanisms:** Simultaneously, the system initiates communication with predefined contacts or emergency services using the GSM module. It sends distress signals, emergency alerts, or notifications via SMS or calls, providing detailed information such as the user's location coordinates and the nature of the emergency.

By integrating these functionalities and processes, the Smart Self-Defense System offers women a proactive and comprehensive solution for personal safety and protection. It empowers users to navigate their environments with confidence, knowing that they have a reliable ally by their side to assist and support them in times of need.

## **HARDWARE IMPLEMENTATION**



**Fig 2: Arduino UNO**

Arduino is an open-source electronics platform based on easy-to-use hardware and software. The Arduino UNO is a standard board of Arduino. Arduino UNO is based on an ATmega328P microcontroller. It can run on both online and offline platforms.



**Fig 3: LCD display**

A liquid-crystal display (LCD) is a flat-panel display that uses the light-modulating properties of liquid crystals. LCD's consumes less amount of power. LCDs are of low cost & Provides excellent contrast.



**Fig 3: Buzzer**

The electric buzzer was invented in 1831 by Joseph Henry. A piezo buzzer is a

type of electronic device that's used to  
produce



a tone, alarm or sound. It's lightweight with a simple construction and low cost product.



**Fig 4: GPS (Global Positioning System):**

The GPS module enables accurate real-time tracking of the user's location. It receives signals from satellites to determine the user's coordinates, providing precise location information that can be used for emergency assistance or navigation purposes.



**Fig 6: GSM (Global System for Mobile Communications):**

The GSM module facilitates communication over cellular networks. It enables the system to send distress signals, emergency alerts, or notifications to predefined contacts or authorities via SMS or calls, ensuring swift assistance in critical situations.

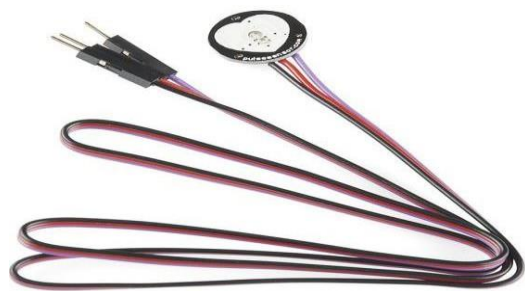


**Fig 7: RFID (Radio - Frequency Identification):**

RFID technology provides access control and authentication features. It allows authorized users to activate or deactivate the system using RFID tags or cards, enhancing security and preventing unauthorized access.

#### **Shocking Device:**

The shocking device delivers a non-lethal electric shock to assailants, incapacitating them temporarily and providing the user with an opportunity to escape to safety. It serves as a last resort self-defense mechanism and can be activated manually by the user in threatening situations.



**Fig 8: Heart beat sensor:**

Heart beat sensors are designed

to give digital output heart beat when a  
finger

is placed on it. When the heart beat detector starts working, the light emitting detector (LED) blinks simultaneously for every heartbeat.

## RESULT



**Fig 9: Output**

Relevant data such as location coordinates, battery level, system status, and alerts are displayed on the LCD screen, ensuring clear and intuitive interaction with the device. Manual inputs from the user, such as pressing a panic button or triggering the shocking device, result in immediate responses tailored to the user's needs and preferences. Only authorized users with valid RFID tags or cards can activate or deactivate the system, ensuring security and preventing unauthorized access..

## FUTURE SCOPE

- 1.Integration of AI for advanced threat detection.
- 2.Enhanced user interface with voice/gesture recognition.
- 3.Biometric authentication for personalized security.
- 4.Connectivity expansion for seamless integration.
- 5.Advanced self-defense mechanisms beyond electric shock.

6.Crowdsourced safety networks for community support.

7.Global adaptation and accessibility initiatives.

8.Collaboration with law enforcement and community organizations for widespread implementation and impact.

## CONCLUSION

The Smart Self-Defense System represents a significant advancement in women's safety technology, offering a proactive and comprehensive solution for personal security. By integrating cutting-edge components such as GPS, GSM, RFID, and a shocking device, the system empowers women to navigate their environments with confidence and assurance. With real-time location tracking, audible alerts, communication with emergency services, and self-defense mechanisms, the system provides

immediate assistance and support in threatening situations. Through its intuitive user interface and manual control options, the system ensures ease of use and adaptability to diverse needs. Overall, the Smart Self-Defense System stands as a testament to innovation and empowerment, striving to create a safer world for women everywhere.

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