

Smart Safety Bag

Ms. Sakshi Arvikar, Ms. Supriya Muley², Ms. Pallavi Jadhav³, Ms. Vaishnavi Sukashe⁴,

Prof. S.R. Kharde⁵

Department of Electronics and Computer, Shreeyash Collage of Engineering,

Chh. Sambhaji Nagar, India

¹sakshiarvikar@gmail.com

Abstract: *In this project, we are presenting the design of a smart bag which provides security for women. Now a days women are highly attacked by men. Numbers of women died from past 2years. Day by day attacks on women are increasing for this to protect women and prevention of their Deaths we brought our project. The smart bag comprises of GSM module, GPS module, emergency switch and Arduino board. The system gets activated by pressing an emergency switch. Upon detecting alarming situation, a high intensity light starts flashing, a siren generates high pitch sound alarm, one pepper spray starts spraying peeper. Very high voltage is also produced on front part of the bag thus hurting the attacker. In the meantime, message is sent automatically to registered numbers mentioning location and the situation.*

Keywords:— *women security, smart bag, global system, GSM, GPS, Arduino Uno.*

1. INTRODUCTION

Women are everywhere arresting men, but unfortunately they are subjected to harassment, torture and violence in public and even in their homes. They cannot leave their homes at any time of the day, they cannot dress well, they cannot choose peace. Girls have certain restrictions that not only take away their freedom but also destroy their dreams and self-confidence. As a result of the above situation, there is a clear need for national efforts to improve women's safety. However, it is also worth noting that the development of technology has led to a large part of the forests to some extent. Therefore, it is now possible to use the advantages of modern technology intelligently in solving social problems.

Therefore, the aim of the program is to help women get rid of the stress of life by using today's technology, the Internet of Things (IoT). It addresses the ever-expanding network of physical objects, the alignment of scientific disciplines with online objects, and the communication that occurs between these objects and other Internet objects and machines. IoT is generally expected to deliver a broad range of devices, systems, and services beyond machine-to-machine (M2M) connections and across multiple systems,

2.LITERATURE REVIEW

With the rising need for personal safety, particularly for women, smart security devices have garnered significant attention. Various researchers and developers have proposed innovative IoT-based solutions integrated into wearable or portable

items like smart bags. These solutions aim to enhance safety through real-time monitoring, communication, and response capabilities.

2.Sensor Integration for Threat Detection:

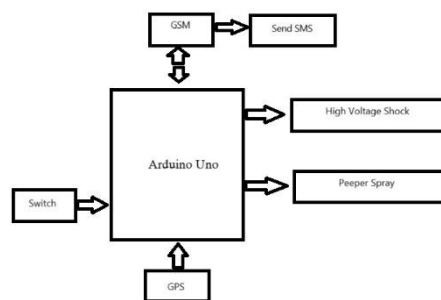
Advanced sensors, such as gyroscopic or accelerometer sensors, can detect abnormal activities like sudden falls or violent movements. Studies indicate that these sensors, when connected to IoT platforms, significantly improve the detection of threats and accidents, triggering timely alerts

3.Panic Buttons and Communication Modules:

A common feature across smart safety bags is the inclusion of panic buttons. When pressed, these buttons can send distress messages to pre-configured contacts or emergency services. Bluetooth and cellular communication modules enhance this functionality,

4.SYSTEM OVERVIEW

The Smart Bag for Women's Security is an IoT-based solution designed to enhance personal safety by integrating various technologies for real-time monitoring, threat detection, and emergency communication. Below is a detailed overview of its key components and functionalities



Key Components:

1. GPS Module:

Enables real-time location tracking, allowing the user's whereabouts to be monitored and shared with pre-configured contacts or emergency services.

2. Sensors:

Includes motion sensors (accelerometer, gyroscope) to detect sudden movements, falls, or impacts, indicating potential threats or distress.

3. Panic Button:

A dedicated button that, when pressed, sends immediate distress alerts with location details to emergency contacts or authorities.

4. Communication Modules:

Equipped with GSM, Bluetooth, or Wi-Fi for transmitting alerts and real-time data, ensuring connectivity even in remote areas.

5. Power Supply:

Powered by rechargeable batteries, with optional solar panels for extended usage, ensuring continuous operation without frequent charging.

6. Microcontroller:

Acts as the central processing unit, managing data from sensors and controlling communication between different components

5.COMPONENT REQUIRED

To design a Smart Bag focused on enhancing women's security, the following components are essential:

1. Core Functional Components:

- **Microcontroller (e.g., Arduino, ESP32):**
 - Acts as the brain of the system, controlling all operations and data processing.
- **GPS Module:**
 - Provides real-time location tracking, crucial for alerting contacts or authorities in emergencies.
- **GSM Module (e.g., SIM800L):**
 - Enables communication through calls or SMS to pre-configured contacts or emergency services.
- **Bluetooth Module (e.g., HC-05/06):**
 - Allows short-range communication with a smartphone app for monitoring and control.

2. Safety and Alert Components:

- **Panic Button:**
 - A physical button that triggers an emergency alert when pressed.
- **Buzzer or Alarm System:**
 - Generates loud sounds to attract attention and deter potential threats.
- **Camera Module:**
 - Captures images or video upon activation, providing visual evidence if needed.

3. Sensors:

1. **Accelerometer and Gyroscope:**

- Detect sudden movements or falls, indicating distress.

2. Temperature and Humidity Sensors:

- Monitor environmental conditions for added safety, ensuring user comfort and detecting unsafe areas.

4. Power Components:

1. Rechargeable Battery (e.g., Lithium-ion):
 - Provides portable power for continuous operation.
2. Solar Panel (Optional):
 - Extends battery life by harnessing solar energy, useful in outdoor environments.
3. Power Management Module:
 - Ensures efficient energy use, managing the power supplied to different components.

5. Communication and Interface:

1. OLED or LCD Display:
 - Provides a user interface for status updates or notifications.
2. LED Indicators:
 - Indicate system status (e.g., battery low, GPS signal acquired).

6. Software and Integration:

1. Mobile Application:
 - Allows the user to configure contacts, receive alerts, and track the bag's location.
2. IoT Platform (e.g., Thing Speak, Firebase):
 - Facilitates data storage and remote monitoring, ensuring seamless integration between hardware and software.

Optional Add-Ons:

- Voice Activation Module: For hands-free operation.
- RFID/NFC: Provides access control and security for the bag's contents.
- Self-defense Mechanism (like a mild electric shock module): For enhanced protection.

6. MODULES FOR SMART BAG FOR WOMEN'S SECURITY

A smart bag designed for women's security involves several interconnected modules to ensure safety, real-time communication, and ease of use. These modules work in

harmony to detect threats, communicate alerts, and provide assistance when needed.

Below is an overview of the key modules:

1. Microcontroller Unit (MCU) Module

- **Function:** Acts as the brain of the system, coordinating inputs and outputs.
- **Components:** Arduino, ESP32, or Raspberry Pi.
- **Role:** Processes data from sensors, triggers alarms, and manages communication with the network.

2. GPS Module

- **Function:** Provides real-time location tracking.
- **Components:** NEO-6M, GPS modules with GSM (SIM900).
- **Role:** Sends the user's location to pre-configured contacts or authorities during emergencies.

3. Panic Button Module

- **Function:** Enables the user to send immediate distress signals.
- **Components:** Push-button switch, capacitive touch button.
- **Role:** Activates emergency protocols, such as sending an alert message or triggering a loud alarm.

4. Sensor Module

- **Function:** Detects abnormal activities or distress conditions.
- **Types of Sensors:**
 - **Accelerometer/Gyroscope:** Detects sudden movements or falls.
 - **Pressure Sensors:** Monitors impact or force.
- **Role:** Triggers alerts based on sensor inputs.

7.CONCLUSION:

The development of smart bags for women's security represents a significant step forward in leveraging technology to enhance personal safety. By integrating IoT technologies, real-time tracking, sensor-based threat detection, and instant communication capabilities, these smart bags provide proactive and reactive responses to potential dangers. The incorporation of features such as GPS tracking, panic buttons, and AI-based risk analysis ensures that users have reliable tools to seek help in emergencies while empowering them to navigate their environments with greater confidence.

Future advancements should focus on improving the accuracy of threat detection algorithms, optimizing power efficiency, and making the technology more accessible and affordable. With continuous innovation and widespread adoption, smart bags have the potential to contribute significantly to creating safer public spaces and fostering a sense of security for women worldwide...

Enhanced AI Integration:

Implementing advanced AI to predict and prevent threats by analysing patterns in user behaviour and environmental data.

IoT Expansion and Connectivity:

Improved IoT infrastructure, including 5G and edge computing, will enhance real-time data transmission and response times, even in remote areas.

Biometric and Security Feature:

Incorporation of fingerprint or voice recognition can ensure that only the authorized user can access or deactivate the bag's security functions.

Advanced Sensor and Wearable:

Integration with health-monitoring sensors to detect vital signs (e.g., heart rate, stress levels) could provide early alerts for dangerous situations.

Blockchain and Data Security:

Using blockchain to securely store and share location and distress data, ensuring privacy and tamper-proof communication.

9.REFERENCE:

- [1] Prof. R.A. Jain, Aditya Patil, Prasenjeet Nikam, Shubham More, Saurabh Totewar, "Women's safety using IOT". Vol: 04 Issue: 05 | May- 2017
- [2] Singh, R., & Kaur, G. (2020). Smart handbag for women safety using Internet of Things. International Journal of Electrical and Computer Engineering, 10(2), 1297-1302.
- [3] Doshi, N., & Shah, D. (2018). IoT based women safety using smart bag. International Research Journal of Engineering and Technology, 5(6), 2477-2480.
- [4] S. Ahir, S. Kapadia, J. Chauhan and N. Sanghavi, "The Personal Stun-A Smart Device For Women's Safety," 2018 International Conference on Smart City and Emerging Technology (ICSCET), Mumbai, India, 2018, pp. 1-3, doi: 10.1109/ICSCET.2018.8537376.
- [5] Deepak Sharma, Abhijit Paradkar "All in one Intelligent Safety System for Women Security". Vol 130 No.11 November 2015.
- [6] S. A. More, R. D. Borate, S. T. Dardige, S. S. Salekar, Prof. D. S. Gogawale "Smart Band for Women Security Based on Internet of Things (IOT)" International Journal of Advance Research in Science and Engineering, Volume No 6, Issue No. 11, November 2017
- [7] K. Rakesh, "Design and implementation of SALVUS women safety device," 2018 3rd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT), Bangalore, India, 2018, pp. 2438- 2442, doi: 10.1109/RTEICT42901.2018.9012442.