

SMART WOMEN SECURITY SYSTEM USING IOT

Project Reference No.: 48S_BE_2136

College : East Point College of Engineering and Technology, Bengaluru
Branch : Department of Computer Science and Engineering
Guide(s) : Mr. Kesavan M V
Student(s): Mr. Abhinav Mallappa Radder
Mr. Abhishek Gowda M S
Mr. Madhan M S
Ms. Rekha S C

Keywords:

Women Safety, IoT, GSM, Self-defence, Smart Wearable Device.

Introduction:

Women's safety remains a pressing issue globally, especially in urban and semi-urban areas where crimes such as harassment and assault are on the rise. Conventional smartphone-based safety solutions are often limited by their dependence on internet connectivity and manual activation during critical emergencies. This creates a need for a standalone, real-time, and easily accessible security solution.

This project addresses the challenge by developing a Smart Women Security System using IoT, which combines multiple sensors, GSM/GPS communication, a shock generator for self-defence, and cloud integration for real-time health monitoring. The system is designed to be user-friendly, cost-effective, and proactive, enabling emergency alerts, location tracking, and even evidence collection without needing internet access. Through this project, the team aims to empower women with technology that enhances their personal security and confidence in public and private spaces.

Objectives:

- To design and implement a wearable IoT-based women safety device.
- To detect emergency scenarios like physical assault, alcohol proximity, and abnormal health indicators.
- To send real-time SMS alerts with location data to emergency contacts using GSM modules.
- To capture and store visual evidence using Python-based image capturing.
- To provide a self-defence shock mechanism to temporarily disable attackers.

- To continuously monitor heart rate and body temperature and update it to the Blynk cloud platform.
- To detect falls and accidents and trigger automatic emergency alerts.

Methodology:

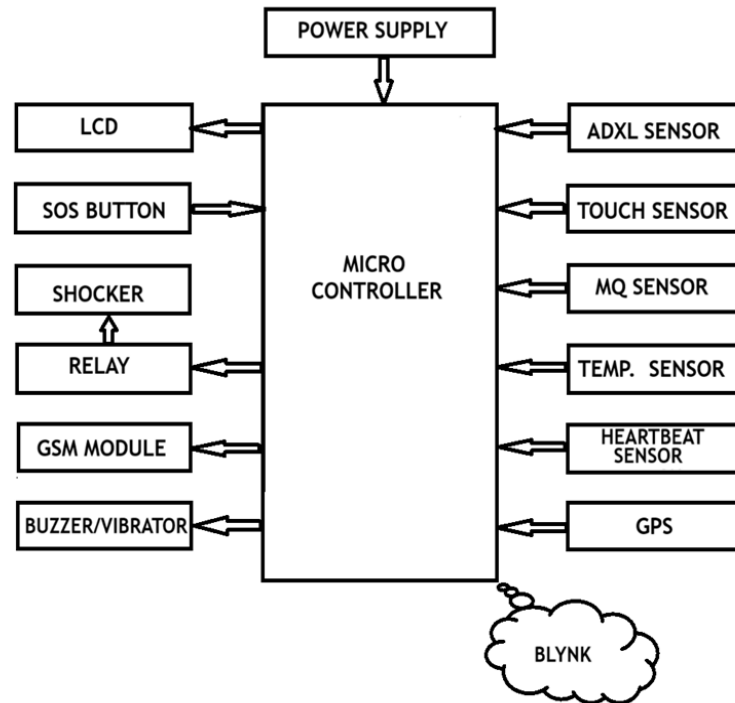


Figure 1: System Architecture

The system uses the ESP32 microcontroller as the core controller, interfacing with various sensors including:

- ADXL accelerometer for fall detection.
- MQ3 for alcohol detection.
- Heartbeat sensor and DHT11 for health monitoring.
- Touch sensor to activate the self-defence shocker.
- GSM module (SIM800C) for sending alerts.
- GPS module for location tracking.

Data is displayed on an LCD and uploaded in real-time to the Blynk Cloud Platform. A relay and shock generator are triggered upon detecting threats, providing self-defence capability. Python scripts are used for camera capture when an emergency is triggered. The system supports both AC and battery-powered operation to enhance portability. The software is implemented using Embedded C for microcontroller logic and Python for peripheral integration.

Result and Conclusion:

The system was successfully implemented and tested. It accurately:

- Sends SMS alerts with location when threats are detected.
- Uploads health data (BPM and temperature) to the Blynk app in real-time.
- Activates buzzer alerts when alcohol is detected.
- Triggers a shock mechanism upon physical contact detection.
- Captures images for evidence through the integrated Python script.

In Conclusion, The Smart Women Security System demonstrates a reliable and responsive solution for personal safety in various environments. It operates independently of internet connectivity, making it suitable for both urban and rural use cases. The integration of cloud monitoring and real-time alerts makes it highly effective in emergency situations.

Project Outcome & Industry Relevance:

The project culminated in a fully functional wearable safety device that can be integrated into daily life. It presents potential applications in public safety, law enforcement, and smart healthcare. This system can serve as a foundational model for commercial wearable safety devices, particularly in developing countries where internet coverage is inconsistent.

Working Model vs. Simulation/Study:

This project resulted in a working hardware prototype tested in real-world conditions.

Project Outcomes and Learnings:

- Acquired hands-on experience in embedded systems, sensor integration, and cloud platforms.
- Learned to interface real-time communication modules (GSM, GPS) with IoT architecture.
- Gained practical experience in Python programming for real-time image capturing.
- Understood the importance of proactive safety solutions in critical emergency response systems.
- Developed teamwork, documentation, and systematic testing skills.

Future Scope:

The future scope of this project includes:

- Integrating machine learning models for better threat detection accuracy based on behaviour.
- Adding voice activation for alert triggering in hands-free scenarios.
- Using video capture or live streaming instead of image capture for more detailed evidence.
- Building a dedicated mobile app for easy configuration and user interaction.