GPS Tracker with Arduino for Girls Safety

Ms.Shweta M. Chavale , Ms. Ashwini S. Bidve, Ms. Ankita K. Biradar ,
Ms. Pooja T. Gavare and Prof. Mr. Lokare A. P.

Student, Department of Information Technology
Professor, Department of Information Technology
Vishweshwarayya Abhiyantriki Padvika Mahavidyalaya, Almala, India

Abstract: *Women's safety is a crucial concern in today's society, necessitating the development of personal security solutions. This project presents a* **women's safety purse**, *integrated with a* **GPS and GSM-based security system**. *The purse is designed to provide instant emergency assistance with the press of a button, ensuring safety in distress situations. It operates on a* **3.7V Li-ion battery** *with a* **5V charging module**, *making it portable and reliable. The purse includes four key switches:* **Call, SMS, Alert, and Shock**, *each serving a vital function for self-defense and communication in emergencies.*

Keywords: Arduino, GPS tracker, Womens safety, personal security, real time location tracking

I. INTRODUCTION

In today's world, women's safety has become a significant concern, with increasing incidents of harassment and violence. Many women feel vulnerable, especially when traveling alone or in unfamiliar areas. While various mobile applications and wearable devices offer safety features, they often require internet connectivity or manual operation through a smartphone. To address this issue, we propose a **women's safety purse**, an independent security system designed to provide immediate help in distress situations without relying on external devices.

The purse integrates a **GPS and GSM-based emergency response system**, allowing real-time location tracking and instant communication. It operates on a **3.7V Li-ion battery** with a **5V charging module**, ensuring portability and long-lasting functionality. Equipped with **four primary safety features**—Call, SMS, Alert, and Shock—this system enables women to take quick action when facing danger. A simple press of the **SMS button** sends an automatic message with a **live GPS location link** to a predefined contact, ensuring that help can reach the user without delay. The **Call button** allows emergency calls, enabling direct communication for assistance.

II. LITERATURE REVIEW

Women's safety has been a topic of extensive research, with various technological solutions proposed to address security concerns. Traditional self-defense tools such as pepper sprays and personal alarms provide immediate assistance but have limitations in modern scenarios. Researchers have explored **mobile-based safety applications** that offer emergency calling and location tracking. For instance, smartphone apps like "bSafe" and "My Safetipin" use **GPS-based tracking** to send alerts to predefined contacts. However, these apps depend on **internet connectivity and smartphone accessibility**, which may not always be available in distress situations.

Several studies have examined **wearable safety devices**, such as smart rings, bracelets, and pendants equipped with **panic buttons and real-time tracking features**. A study by Sharma et al. (2020) highlights the effectiveness of **IoT-based security devices** that integrate **GPS and GSM modules** for emergency communication. However, many of these wearables have **limited battery life and require frequent charging**, making them less practical for long-term use. Additionally, some devices rely on Bluetooth connectivity, which restricts their range and effectiveness.

Recent advancements in **embedded systems and microcontroller-based safety solutions** have paved the way for **independent security devices**. Research by Kumar et al. (2021) discusses the use of **Arduino-based safety systems** that incorporate **GSM technology** for sending emergency alerts via SMS. These systems ensure **direct communication without requiring internet access**, making them more reliable. Additionally, integrating **buzzer alarms and self-defense mechanisms** enhances user protection by providing immediate deterrents against potential threats.

III.METHODOLOGY

The development of the Arduino-based GPS tracker for women's safety involved asystematic approach that encompassed design, implementation, testing, and evaluationphases.

The following sections outline the methodology followed in this project.

System Design: Arduino Microcontroller,GPS Module,Power Supply,User Interface

Database: EEPROM (Electrically Erasable Programmable Read-Only Memory),Data Analysis Tools.

Authentication: User Authentication Methods(password based authontication).

Maps Integration: Google Maps API.

External Services (e.g., SMS Gateway, Mapping API)

 Data Flow: Location Data Capture, Data Processing,User Interaction,Emergency Alerts,Real-Time Updates.

IV. CONCLUTION

The implementation of the Arduino-based GPS tracker for women's safety represents a significant advancement in personal security technology, combining hardware and software components to create a comprehensive safety solution. By leveraging GPS and GSM technologies, the system provides real-time location tracking and emergency alert capabilities, empowering users to take control of their safety in potentially dangerous situations.

The modular architecture of the system, which includes distinct components for GPS tracking, GSM communication, user management, backend services, and mapping integration, allows for flexibility and scalability. This modular approach not only simplifies the development process but also facilitates future enhancements and maintenance.
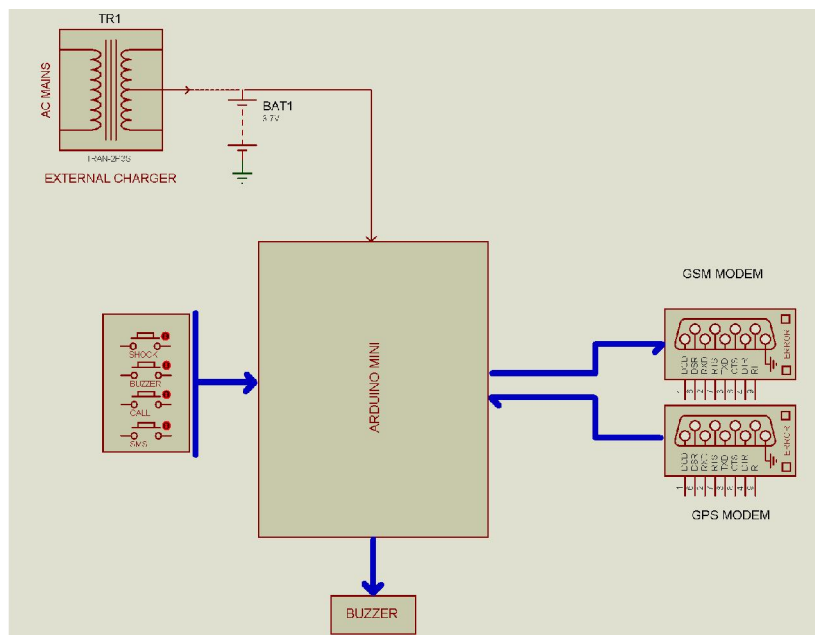
V. ACKNOLEGEMENT

VI. RESULT & DISCUSSION

The implementation of the Arduino-based GPS tracker for women's safety yielded several significant results, demonstrating the effectiveness and practicality of the system. This section discusses the outcomes of the project, evaluates the performance of the various components, and reflects on the implications of the findings.
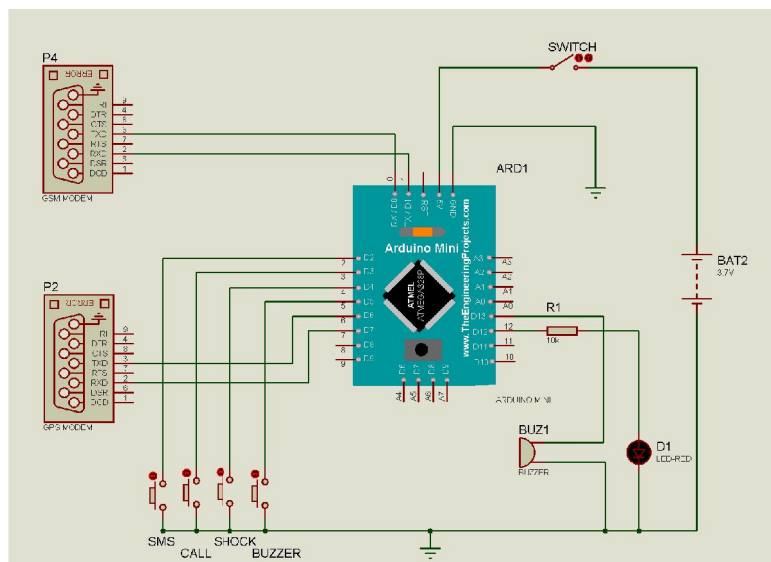
In this chapter we are going to know about 'GPS TRACKER WITH ARDUINO FOR GIRLS SAFETY' block diagram and description of block diagram.

1. BLOCK DIAGRAM

1. CIRCUIT DIAGRAM

REFERENCES

[1]. https://circuitdigest.com/microcontroller-projects/arduino-based-women-safety-device-for-emergency-alert-and-tracking

[2]. https://ijarsct.co.in/Paper1548.pdf

[3]. https://www.irjmets.com/uploadedfiles/paper//issue_12_december_2023/47012/final/fin_irjmets1701782038.pdf