

ACCIDENT DETECTION AND WOMEN SAFETY SYSTEM

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INTRODUCTION

- Women's safety has become a serious concern due to increasing incidents in public and isolated areas.
- This project aims to develop an electronic safety system that can automatically detect suspicious movement or distress sounds and immediately trigger an alert.
- Using the ESP32 microcontroller with PIR and sound sensors, real-time monitoring and fast response can be achieved to improve safety.
- In many outdoor and public areas, accidents such as collisions, falls, or sudden impacts often go unnoticed, especially during late hours or in low-traffic zones.
A delay in identifying accidents can lead to severe injuries, long response times, and even fatalities.

PROBLEM STATEMENT

- Women often travel through low-crowd or poorly monitored areas where timely help is not available.
- Most public infrastructure is not capable of identifying or responding to dangerous situations. Hence, an automated system is needed to **detect suspicious movement or distress sounds** and generate immediate alerts.
- Traditional systems rely on manual reporting, which may be delayed or impossible if the victim is unconscious.
There is no automated mechanism to detect abnormal events such as sudden falls, crashes, or impact noises.
- Hence, a smart system is required to **detect accidents instantly** and raise an alert to enable faster response.

OBJECTIVES

- Detect human motion in sensitive outdoor areas
- Identify loud distress sounds (screams, cries for help)
- Trigger an audible alert through a buzzer
- Support IoT-based communication using ESP32 (optional)
- Enhance safety through automated monitoring
- To detect unusual or sudden motion indicating a possible accident
- To identify loud impact sounds

SCOPE

- Scalable across multiple locations
- Can integrate with existing infrastructure easily
- Can support advanced features like lighting control or notifications
- Can be deployed in outdoor public zones
- Useful in low-traffic, isolated or risky locations
- Can be integrated with existing public infrastructure
- Supports additional features like IoT monitoring, lighting control, or emergency alerts
- Scalable for smart-city applications

Hardware Requirements

- ESP32 Dev Module
- PIR Motion Sensor
- Sound Sensor Module
- Buzzer
- Mounting box/fixture (for outdoor placement)
- Power supply
- Wires and connectors

Software Requirements

- Arduino IDE
- ESP32 board package
- Sensor libraries (if required)
- Wi-Fi setup code (optional)

PIN CONNECTIONS

PIR Sensor → ESP32

OUT → GPIO 14

VCC → 5V

GND → GND

Sound Sensor → ESP32

OUT → GPIO 27

VCC → 3.3V

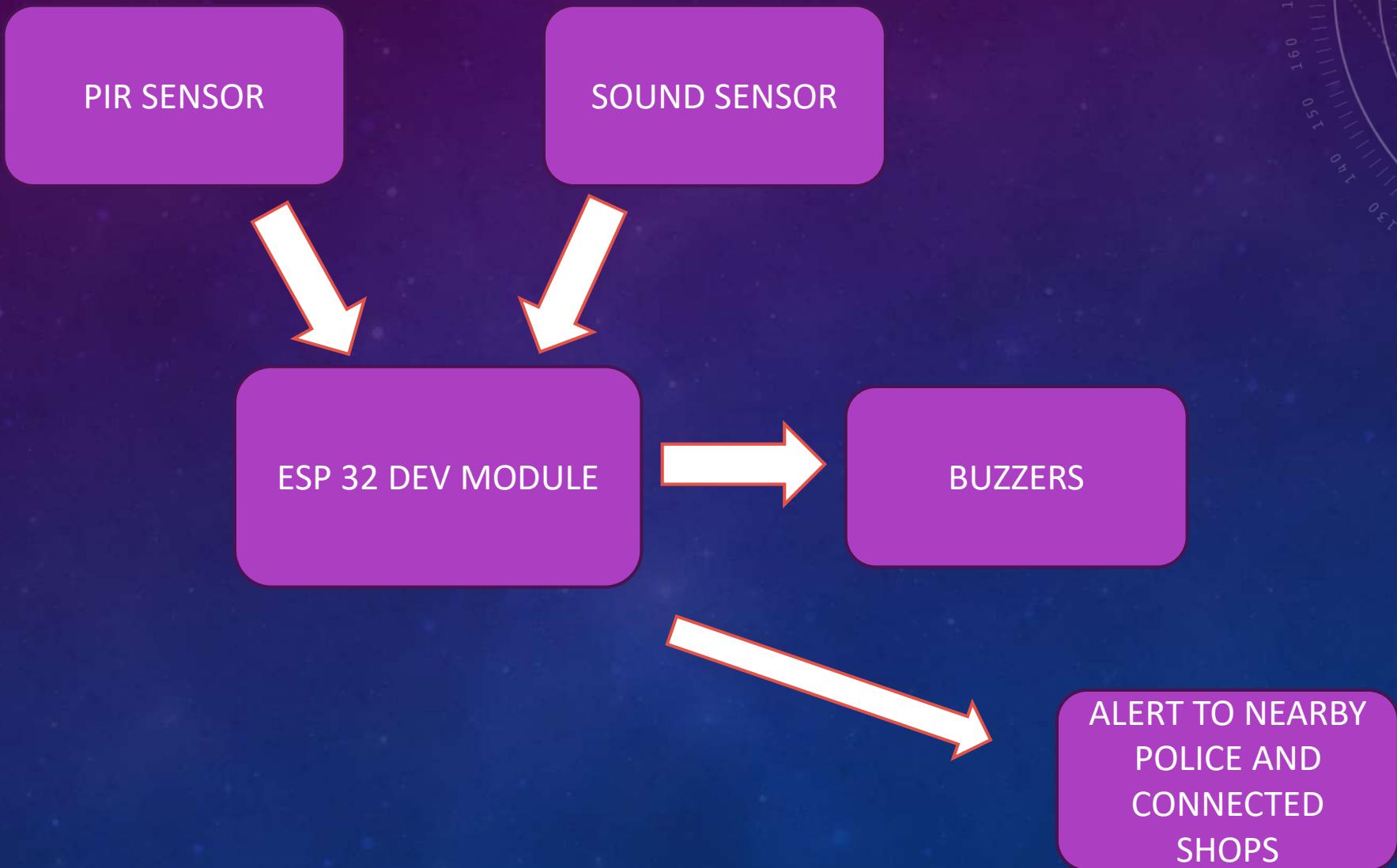
GND → GND

Buzzer → ESP32

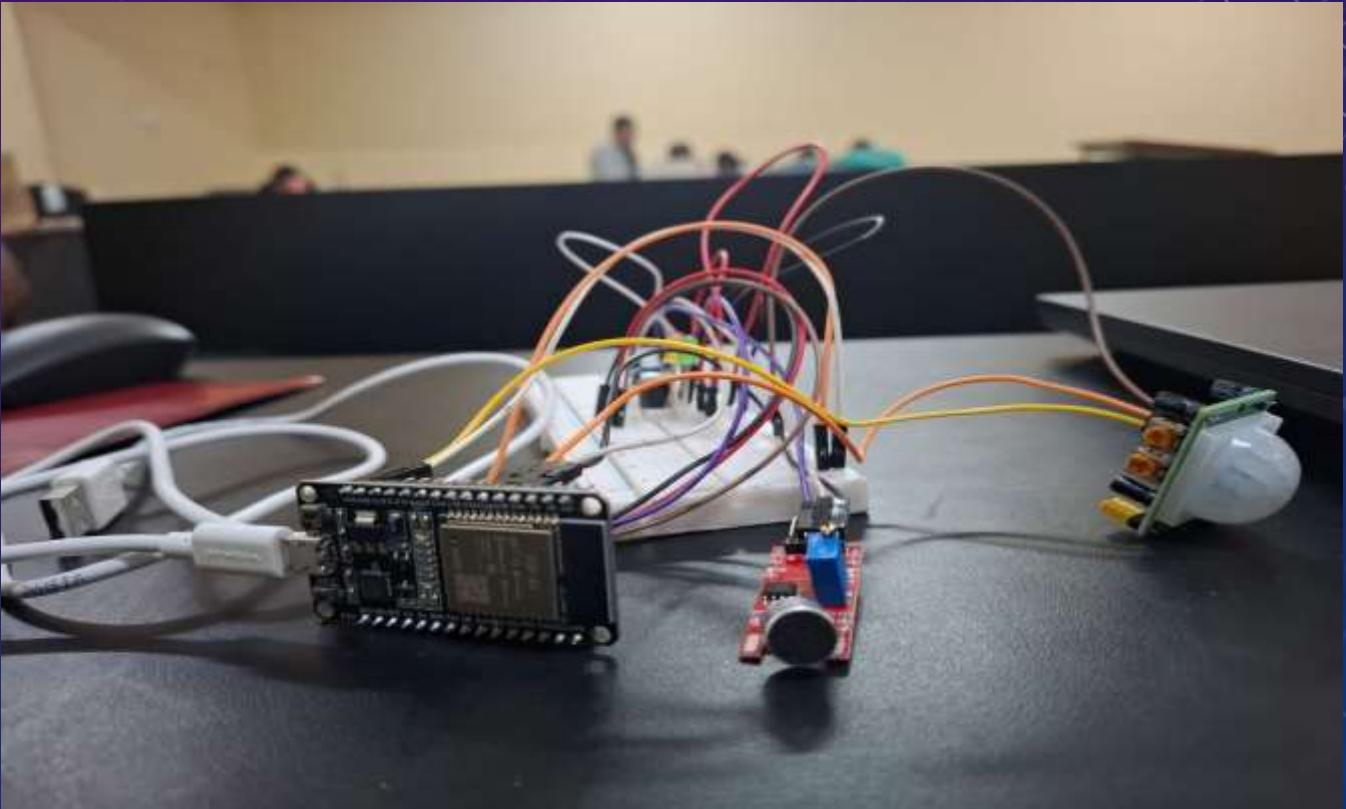
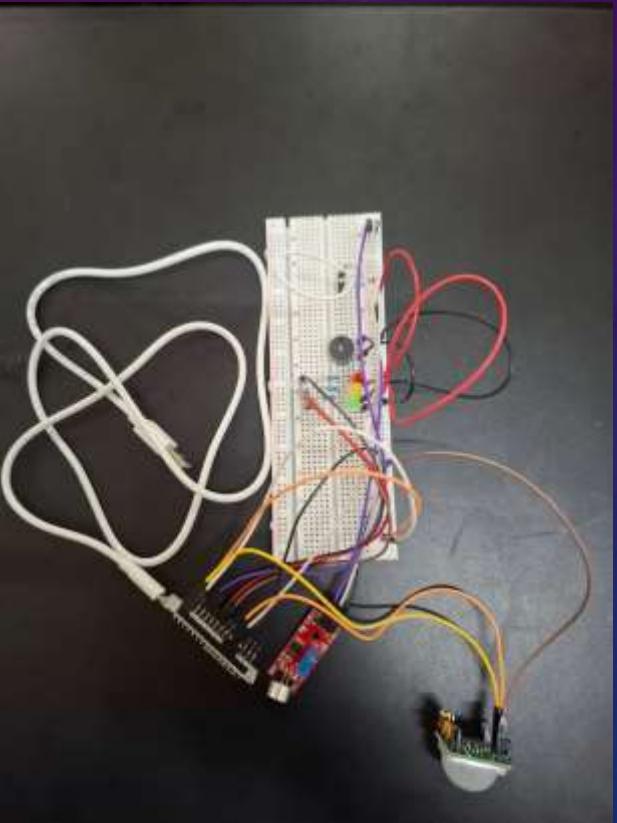
Positive → GPIO 5

Negative → GND

BLOCK DIAGRAM



PROTOTYPE

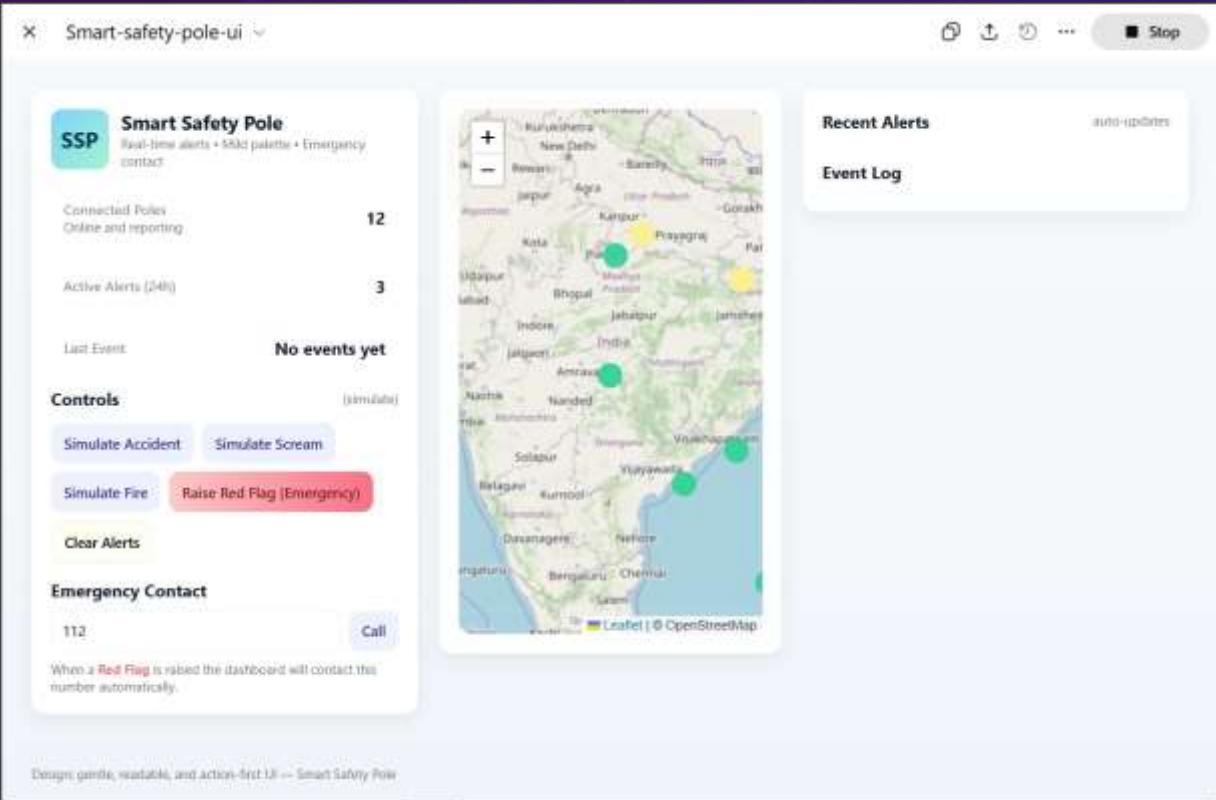


FIRE BASE

```
https://protoz-9171b-default-rtdb.firebaseio.com/.json
{
  "status": "Online",
  "light": 0,
  "pir": 1,
  "sound": 371,
  "st": "CAUTION",
  "ts": "144122"
}

Database location: Singapore (asia-southeast1)
```

FRONTEND



CONCLUSION

The system provides an effective, automated safety mechanism suitable for public outdoor environments.

By combining motion detection, sound analysis, and immediate alerting, the solution enhances security and helps prevent unsafe incidents.