

# **Component List**

## **Machine learning-Enhanced Portable Gas Detection System for Mines**

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### **Microcontroller and Communication**

1. **Bharat Pi LoRa Module with ESP32** (Integrated LoRa RFM95W 868MHz Transceiver)
2. **USB to Serial Converter** (for ESP32 programming)

### **Sensors**

1. **BME280**: Temperature, humidity, and atmospheric pressure sensor
2. **BH1750**: Light intensity sensor
3. **MQ-135, MQ-7, MQ-2**: Gas sensors for air quality and hazardous gases
4. **Figaro TGS 2600**: Air quality sensor
5. **TGS822**: Alcohol gas sensor

### **Outputs**

1. **Piezo Buzzer**: Audio alarm
2. **Tri-color LED (Red, Yellow, Green)**: Visual status indicator
3. **5V 10A 1 Channel Relay Module**: For exhaust fan control

### **Storage and Power**

1. **MicroSD Card**: For data logging
2. **Li-ion Rechargeable Battery (3.7V)**: Power source
3. **AC 220V Dual Battery Charger**: For battery recharging

### **Display**

1. **Waveshare 2.42-inch OLED Display**: Data visualization