Empowering the Youth; Empowering the Nation

Surface Inspection Robot

MINI PROJECT

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Project Overview

INSPIROBOT-X

InspiroBot-X is a ground-based, robotic system designed for automated infrastructure inspection and maintenance.

- Modern industries require constant inspection for safety and efficiency

- Human inspection labor faces increasing challenges in hazardous and hard-to-reach environments

InspiroBot-X offers a smart, ground-based solution for automated inspections

The efficiency and accuracy of industrial inspections is an ongoing and essential task to ensure the safety of workers, longevity of equipment and reduced risk of unnecessary down time

Current Inspection Labor Problems

- Exposure to toxic environments (e.g., smoke, gas leaks)

- Physical fatigue and safety risks for workers

- Inconsistency in data due to human error

Robo Solution - Why InspiroBot-X?

- **Reduces human exposure to hazardous areas**

- **Operates consistently with real-time sensor data**

- **Performs faster inspections with better accuracy**
  - High labor costs and time-consuming inspections

  - **Reduces long-term costs and improves safety standards.**

Advantages of InspiroBot-X

•• Autonomous or remote-controlled ground movement

•• Real-time data monitoring of environment

•• Accurate detection of smoke, temperature changes, and air quality

•• Compact and mobile, adaptable to various terrains

•• **Data logging for future analysis and reports**

Key Components

1. **Chassis & Wheels: Durable and terrain-friendly mobility**

2. **Temperature Sensor (e.g., DHT22): Detects heat levels**

3. **Smoke Sensor (e.g., MQ-2): Detects presence of smokeor gas**

4. **Air Quality Sensor (e.g., MQ-135): Monitors pollutants like**
CO2

5. **Microcontroller (e.g., Arduino or Raspberry Pi): Central control unit**

6.Battery Pack: Portable power source

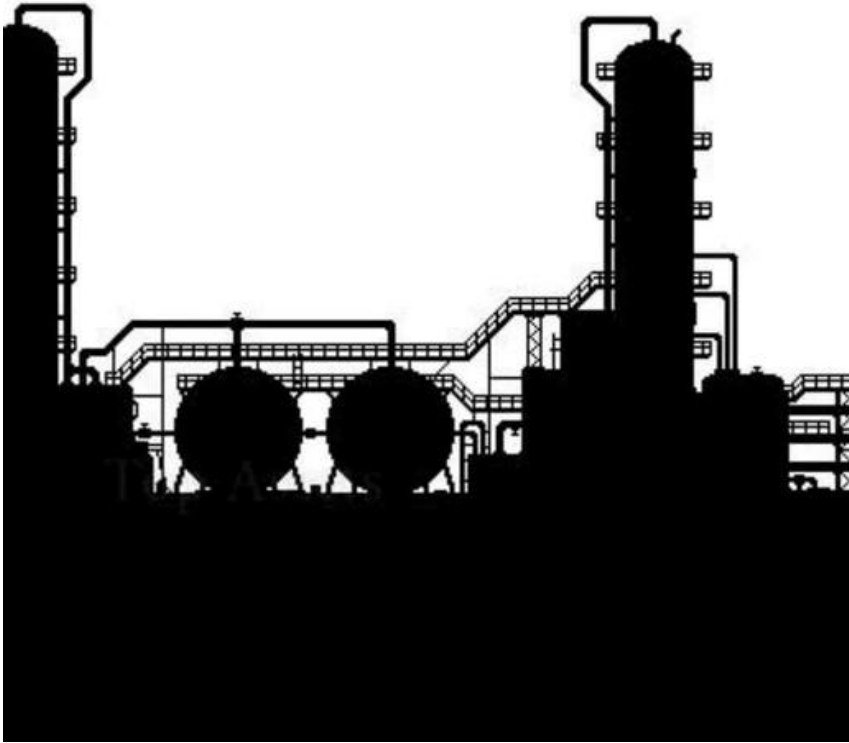**7. Wireless Module (e.g., Wi-Fi/Bluetooth): Remote communication**

Use Case Examples

•• **Industrial plant inspection**

•• **Underground tunnel safety checks**

•• **Fire rescue operations (pre-inspection)**

•• Air pollution monitoring in confined spaces

Conclusion

- **InspiroBot-X is a modern, efficient solution to traditionalinspection challenges**

- **It improves safety, accuracy, and cost-efficiency**

- **Future-ready for integration with AI and machinelearning for predictive maintenance**

THANK YOU