Portable Gas Detecting Device

ENHANCING SAFETY AND MONITORING THROUGH ADVANCED SENSOR TECHNOLOGY

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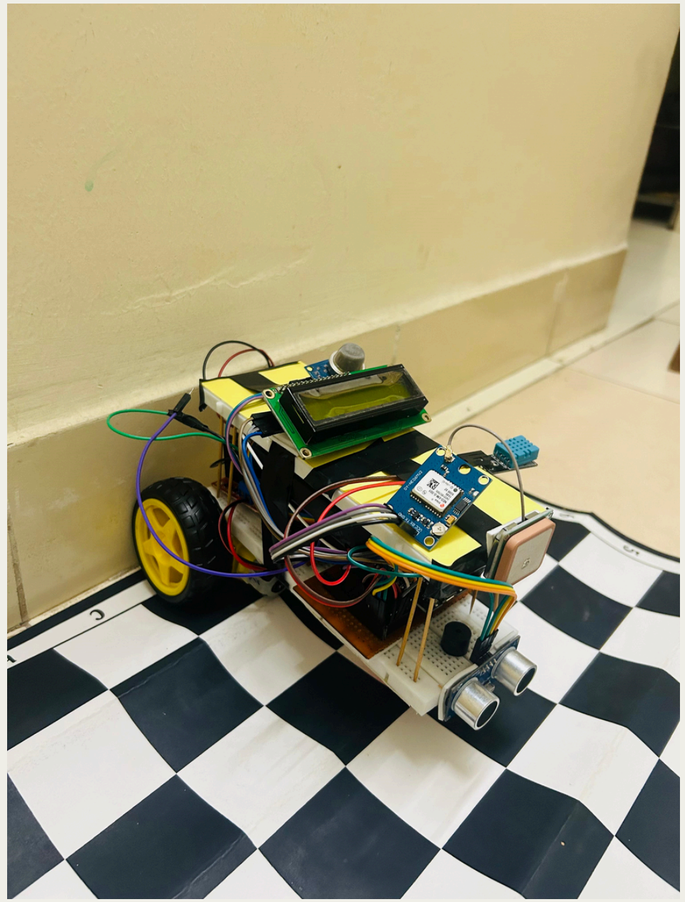
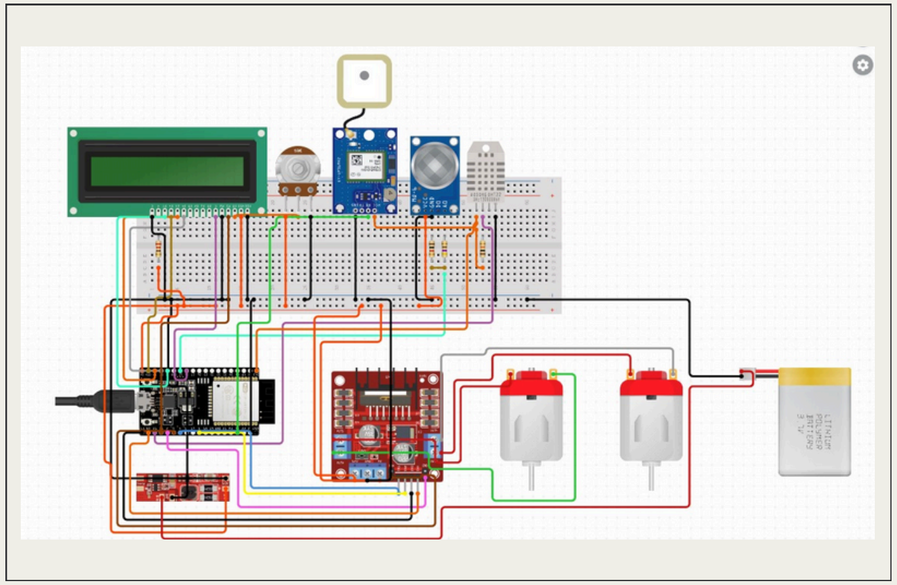
COMPONENTS USED

- Lithium Batteries
- Ultrasonic Distance Sensor (4 pin)
- ESP32
- L298N Motor Driver
- DC Motors
- MQ6
- DHT11
- GPS Module



CIRCUIT DIAGRAM AND DESIGN

- This circuit diagram shows the ESP32 microcontroller as the central component.
- It interfaces with multiple sensors and modules to create a smart robotic system.
- The ESP32 connects to an ultrasonic sensor (HC-SR04) for measuring distances.
- A DHT11 sensor gathers temperature and humidity data.
- An MQ-6 gas sensor detects gases.
- A GPS module (NEO-6M) is used for tracking location.
- An LCD (16x2) display shows real-time data output, including sensor readings and status updates.
- The motor driver (L298N) controls two DC motors, allowing movement in various directions.
- The system operates on a 12V battery.
- A power supply module regulates the voltage to maintain stable levels for the ESP32 and its connected components.
- This setup enables the ESP32 to monitor environmental conditions, navigate using GPS coordinates, and respond to commands.



It displays pertinent information on the LCD.

WORKING

- The car uses two DC motors controlled by an L298N motor driver, allowing it to move forward, backward, left, or right based on commands sent by an ESP32.
- An ultrasonic sensor (HC-SR04) detects obstacles, with the ESP32 adjusting the car’s path to avoid collisions, displaying the distance on an LCD.
- The MQ-6 gas sensor monitors harmful gases, triggering a warning on the LCD when detected.
- The DHT11 sensor records ambient temperature, which is also shown on the display.
- The 16x2 LCD provides real-time updates on gas detection, obstacle distance, and temperature, making the car an autonomous hazard-detection robot..

APPLICATIONS

1. **Modern Safety Technology:**
- Addresses current and future industrial challenges, emphasizing worker protection in hazardous environments.
2. **Proactive Gas Detection:**
- Detects dangerous gas leaks early, ensuring the safety of personnel with minimal disruption to daily operations.
3. **Importance of Innovation:**
- Highlights the critical role of advanced gas detection systems in industrial safety practices.
4. **Risk Mitigation:**
- Reduces risks, improves emergency response times, and safeguards lives through real-time gas monitoring.
5. **Off-Grid Safety Solution:**
- Offers reliable and portable safety measures, independent of traditional power grids.
6. **Seamless Integration:**
- Demonstrates how technological innovation can integrate effortlessly into real-world industrial operations.
7. **Future Vision:**
- Envisions these sensors becoming standard in workplaces globally, creating safer environments.
8. **Accessibility and Convenience:**
- Makes safety measures more accessible and practical for everyday use in various industries.

References

1. https://openai.com/index/chatgpt/
2. https://www.youtube.com/watch?v=RiYnucfy_rs
3. https://www.youtube.com/watch?v=rSCy1_GbC0w&t=4s

Thank you!

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