EXPERIMENT 21: GAS DETECTING ROBOT

Objective: The objective of this experiment is to create a fire-detecting robot that can sense the presence of fire using a gas sensor. Upon detecting a certain level of gas, the robot activates an alarm (buzzer) and stops its movement.

Setup:

- Assemble the robot hardware according to the instructions in Section 2.1.
- Connect the robot to the Arduino IDE as explained in Section 2.3.
- **Hardware Assembly:**
  - Connect the buzzer to digital pin 2 on the Arduino.
  - Connect the gas sensor to analog pin A0 on the Arduino. Please refer the link for the connection: Gas sensor Arduino connection
  - Connect the motor control pins:
    - IN1 to pin 8 (Input 1 of Motor A)
    - IN2 to pin 9 (Input 2 of Motor A)
    - IN3 to pin 10 (Input 1 of Motor B)
    - IN4 to pin 11 (Input 2 of Motor B)

Code Example: Fire Detecting Robo

Usage Instructions:

- **Power On:**
  - Connect the Arduino to a power source.
  - Ensure that the gas sensor is properly positioned to detect the presence of fire.
- **Operation:**
  - The robot will continuously monitor the gas sensor readings.
  - If the gas level surpasses a threshold (value > 120), indicating the presence of fire, the robot will:
    - Trigger the buzzer alarm.
    - Stop its movement.
- **Indication:**
  - The serial monitor will display the analog readings from the gas sensor.
  - "GAS Detected!" will be printed if the gas level exceeds the threshold.
- **Reset:**
  - To restart the robot, remove the fire source or lower the gas levels.
  - Press the reset button on the Arduino if needed.

Expected Results: The robot should promptly respond to the detection of fire by activating sounding the buzzer, and halting its movement. The serial monitor provides real-time feedback on gas sensor readings.

Additional Information: This experiment highlights a basic fire-detecting mechanism using a gas sensor, offering potential applications in safety and security systems.

FAQs:

Q. What should I do if the robot does not stop when gas is detected? A. Check the connections and ensure the gas sensor is functioning correctly. Adjust the threshold if needed.

Q. Can I modify the code for different motor speeds? A. Certainly, adjust the PWM values in the code for **moveForward()** as per your requirements.

Q. How can I extend the functionality of this robot? A. You can integrate additional sensors, communication modules, or enhance the alarm system for specific applications.