

FINAL VERSION Materials and Procedure

Materials

- Icd (Liquid Crystal Display) screen
- M7 photoresistor module
- DHT11 Temperature and humidity sensor
- Flying Fish CO detector module
- Green LED
- Potentiometer
- 220Ω resistor
- Active buzzer
- Arduino Uno
- Jumper wires
- Small chalkboard
- Various hardware
- Breadboard
- Battery pack
- 8 AA batteries
- Elegoo smart robot car v 4.0 kit
- Arduino cord
- A drill
- A computer

Procedure

1. Assemble the Elegoo kit
2. Drill holes in the top platform and the chalkboard
3. Secure the chalkboard on top of the platform using four screws, eight washers, and eight nuts
4. Secure the breadboard on to the surface of the chalkboard with double-sided tape
5. Put the batteries in the battery box
6. Put double-sided tape on the bottom of the battery box and fix it to the top of the robot car battery
7. Secure the Arduino to the bottom of the Raspberry Pi case using two small screws
8. Fix the Raspberry Pi case with the Arduino inside across from the breadboard using double-sided tape
9. Wire the photoresistor module and LED
 - Photoresistor pin AO to analog zero (A0) on Arduino
 - Pin DO to LED anode (positive/longer leg) pin

- Pin GND to negative column on the breadboard
- Pin VCC to positive column on the breadboard
- LED cathode (negative/shorter leg) to negative column on the breadboard

10. Wire the DHT11 temperature and humidity sensor

- (-) pin to negative column on breadboard
- OUT pin to digital pin 7 on Arduino
- (+) pin to positive column on breadboard

11. Wire the CO module and active buzzer

- Pin DO to Arduino digital pin 8
- GND pin to negative column on breadboard
- VCC pin to positive column on breadboard
- Buzzer positive pin (longer leg) to digital pin ~9 on Arduino
- Buzzer negative pin (shorter leg) to negative column on breadboard

12. Wire the LCD, resistor, and potentiometer

- LCD pin one to negative column on the breadboard
- LCD pin two to positive column on the breadboard
- LCD pin three to the center pin on the potentiometer
- LCD pin four to digital pin twelve on the Arduino
- LCD pin five to negative column on breadboard
- LCD pin six to digital pin ~11 on the Arduino
- LCD pins seven to ten; nothing
- LCD pin eleven to digital pin ~5 on the Arduino
- LCD pin twelve to digital pin 4 on the Arduino
- LCD pin thirteen to digital pin ~3 on the Arduino
- LCD pin fourteen to digital pin 2 on the Arduino
- LCD pin fifteen to resistor pin
- LCD pin sixteen to negative column on the breadboard
- Potentiometer right pin to negative column on the breadboard
- Potentiometer center pin to LCD pin three
- Potentiometer left pin to positive column on the breadboard
- Remaining resistor pin to the positive column on the breadboard

13. Connect power to the breadboard

- GND pin on Arduino to top of negative column on the breadboard
- 5V pin on Arduino to the top of the positive column on the breadboard

14. Code the sensors, LCD, LED, and buzzer

15. Upload the code to the Arduino

16. Connect the Arduino to the battery pack with the Arduino cord

17. Test the robot (drive it, light a match near the CO sensor, test the LED and photoresistor, and the LCD screen and DHT11 sensor)

18. Record results

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