Measuring instrument project

Car robot with obstacle avoiding, Bluetooth control and voice control

Dr. Asmaa Elsakaan

Dr. Asmaa barakat

Team members:

الاسم	السيكشن
خالد واصف هليل على	2
هيثم هشام عبده	7
محمد مجدى شحاتة محارب	5
فادية محمد البرى	4
بسملة طه محمد	2
سهيلة عبدالناصر حسين	3
أسماء طاهر محمد	2
شذى ايمن كامل	3
فرح هشام محمد	4
فاطمة كمال بلال	4

Group 7

Introduction

In this tutorial, we will learn how to make a multi-functional robot using the Arduino platform. That is, this includes obstacle avoidance, Bluetooth control, and voice control functions. Also, it mainly uses an Ultrasonic sensor and a Bluetooth module. The L293D motor drive shield is used to drive the motors. Also, in this tutorial, you will be able to easily create this as the tutorial shows you step by step how to build this robot car.

The process of this robot

We can control this robot car using three methods. That is,

1.Obstacle avoidance

In this case, the robot car moves along using the obstacle avoiding. The ultrasonic sensor is mainly used for this purpose. Study the previous articles for more information.

2.Bluetooth control

In this case, we can control the robot through an app on the smartphone. The Bluetooth module is used for this.

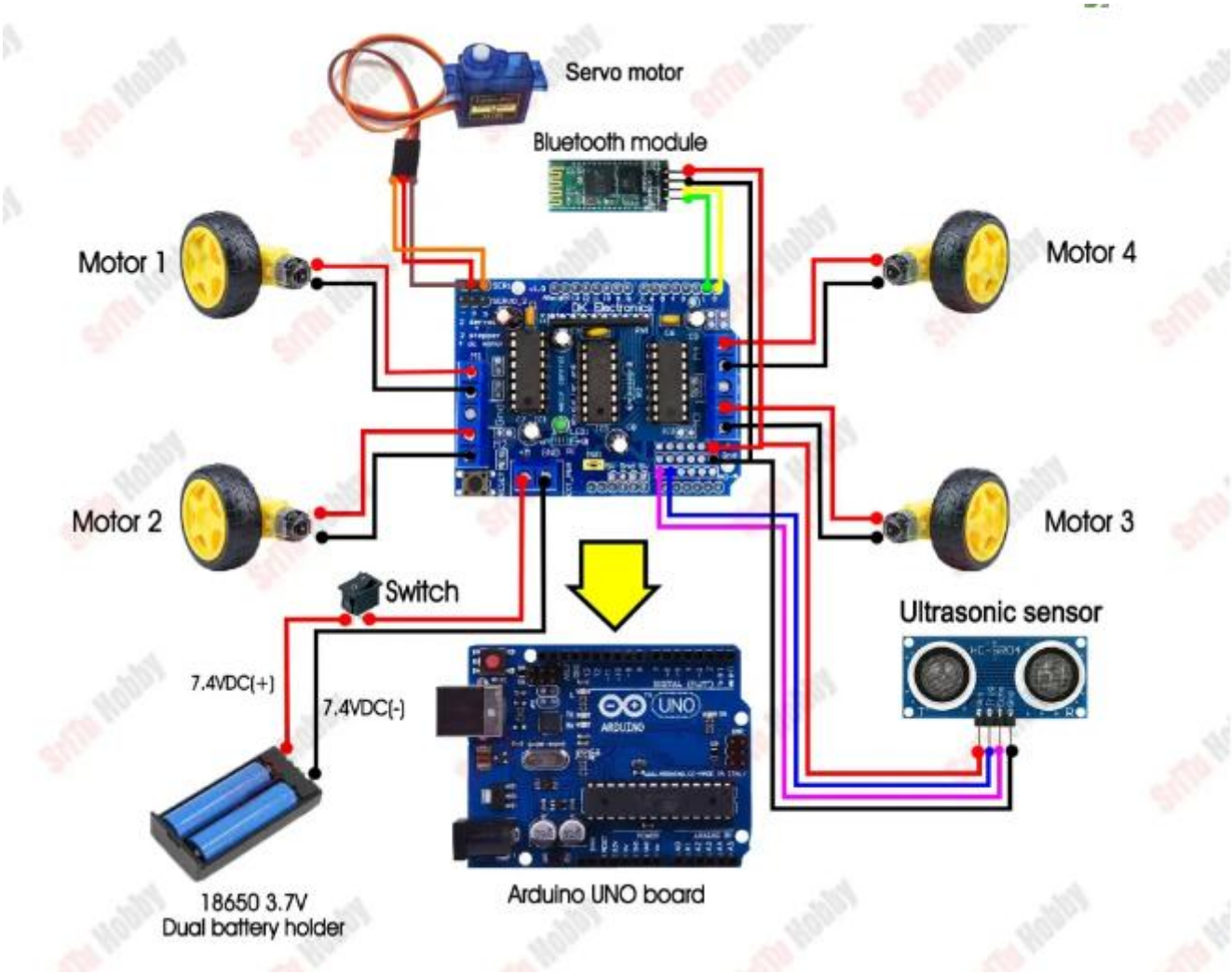
3.voice control

In this case, we can control this robot using several voice commands. This also requires a Bluetooth module and mobile app.

components

1. Arduino UNO board x 1
2. L293D motor driver x 1
3. Ultrasonic sensor x 1
4. Bluetooth module x 1
5. Servo motor x 1
6. Gear motor x 4
7. Robot wheel x 4
8. Li-ion battery holder x 1
9. Li-ion battery x 3
10. Jumper wires
11. Cardboard

Circuit diagram



Code

```
#include <Servo.h>
#include <AFMotor.h>
#define Echo A0
#define Trig A1
#define motor 10
#define Speed 170
#define spoint 103
char value;
int distance;
int Left;
int Right;
int L = 0;
int R = 0;
int L1 = 0;
int R1 = 0;
Servo servo;
AF_DCMotor M1(1);
AF_DCMotor M2(2);
AF_DCMotor M3(3);
AF_DCMotor M4(4);
void setup() {
  Serial.begin(9600);
  pinMode(Trig, OUTPUT);
  pinMode(Echo, INPUT);
  servo.attach(motor);
  M1.setSpeed(Speed);
  M2.setSpeed(Speed);
  M3.setSpeed(Speed);
  M4.setSpeed(Speed);
}
void loop() {
  //Obstacle();
  //Bluetoothcontrol();
  //voicecontrol();
}
void Bluetoothcontrol() {
  if (Serial.available() > 0) {
    value = Serial.read();
    Serial.println(value);
  }
  if (value == 'F') {
    forward();
  } else if (value == 'B') {
    backward();
  } else if (value == 'L') {
    left();
  } else if (value == 'R') {
```

```
    right();
  } else if (value == 'S') {
    Stop();
  }
}
void Obstacle() {
  distance = ultrasonic();
  if (distance <= 12) {
    Stop();
    backward();
    delay(100);
    Stop();
    L = leftsee();
    servo.write(spoint);
    delay(800);
    R = rightsee();
    servo.write(spoint);
    if (L < R) {
      right();
      delay(500);
      Stop();
      delay(200);
    } else if (L > R) {
      left();
      delay(500);
      Stop();
      delay(200);
    }
  } else {
    forward();
  }
}
void voicecontrol() {
  if (Serial.available() > 0) {
    value = Serial.read();
    Serial.println(value);
    if (value == '^') {
      forward();
    } else if (value == '-') {
      backward();
    } else if (value == '<') {
      L = leftsee();
      servo.write(spoint);
      if (L >= 10 ) {
        left();
        delay(500);
        Stop();
      } else if (L < 10) {
        Stop();
      }
```

```
    } else if (value == '>') {
      R = rightsee();
      servo.write(spoint);
      if (R >= 10 ) {
        right();
        delay(500);
        Stop();
      } else if (R < 10) {
        Stop();
      }
    } else if (value == '*') {
      Stop();
    }
  }
}
// Ultrasonic sensor distance reading function
int ultrasonic() {
  digitalWrite(Trig, LOW);
  delayMicroseconds(4);
  digitalWrite(Trig, HIGH);
  delayMicroseconds(10);
  digitalWrite(Trig, LOW);
  long t = pulseIn(Echo, HIGH);
  long cm = t / 29 / 2; //time convert distance
  return cm;
}
void forward() {
  M1.run(FORWARD);
  M2.run(FORWARD);
  M3.run(FORWARD);
  M4.run(FORWARD);
}
void backward() {
  M1.run(BACKWARD);
  M2.run(BACKWARD);
  M3.run(BACKWARD);
  M4.run(BACKWARD);
}
void right() {
  M1.run(BACKWARD);
  M2.run(BACKWARD);
  M3.run(FORWARD);
  M4.run(FORWARD);
}
void left() {
  M1.run(FORWARD);
  M2.run(FORWARD);
  M3.run(BACKWARD);
  M4.run(BACKWARD);
}
```

```
void Stop() {
  M1.run(RELEASE);
  M2.run(RELEASE);
  M3.run(RELEASE);
  M4.run(RELEASE);
}
int rightsee() {
  servo.write(20);
  delay(800);
  Left = ultrasonic();
  return Left;
}
int leftsee() {
  servo.write(180);
  delay(800);
  Right = ultrasonic();
  return Right;
}
```

Obstacle avoidance program

OK, now connect this robot car to the computer. Then, remove the two forward slashes in front of the “obstacle” function. Next, remove the RX and TX jumper wires connected to the Bluetooth module.

Now, select board and port. After, upload this code to the robot and reconnect the RX and TX jumper wires.

Now, power On this robot and enjoy it.

Bluetooth control program

OK, now connect this robot car to the computer. Then, remove the two forward slashes in front of the “Bluetooth control” function. Next, remove the RX and TX jumper wires connected to the Bluetooth module.

Now, select board and port. After, upload this code to the robot and reconnect the RX and TX jumper wires.

OK, now download and install the app to control the car.

After, run this application and click the Settings button. Then, click the “Connect to Car” button and select the name of the Bluetooth module. Now, you can see the green bulb in the corner.

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