Contents

Requirement specifications

LIBRARIES REQUIRED

- ❑ AF motor library

HARDWARE REQUIRED

- ❑ Arduino UNO board x 1
- ❑ IR sensor x 2
- ❑ L293D motor driver x 1
- ❑ Gear motor x 4
- ❑ Robot wheel x 4
- ❑ Li-battery holder x 1
- ❑ Li-battery x 2
- ❑ Jumper wires
- ❑ Dot board(12cm x 18cm)

SOFTWARE REQUIRED

- ❑ Operating system: Windows 10 or more
- ❑ Arduino

Abstract

Upon activation, the robot car engages its two infrared (IR) sensors, which begin detecting inputs. When a hand approaches the left sensor, it triggers a signal causing the robot car to turn left. Similarly, when a hand approaches the right sensor, the car responds by turning right. Furthermore, if both sensors detect a hand movement simultaneously, the robot car moves forward in response to the combined signals from the sensors. This design enables intuitive control and navigation, allowing users to interact with the robot car effortlessly using hand gestures.

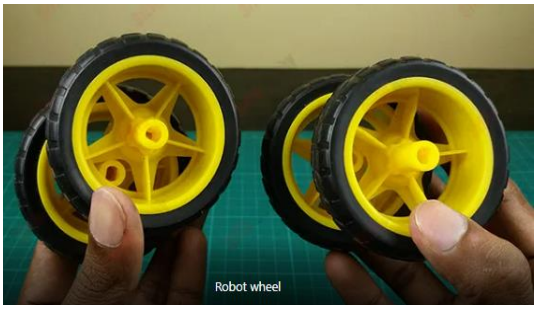
Introduction

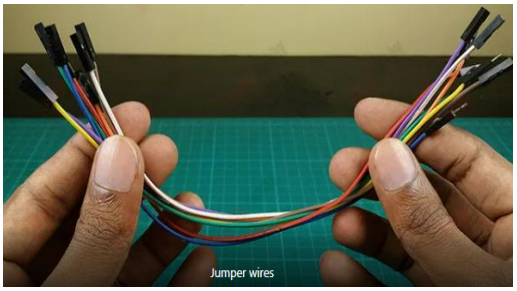
Obstacle-Aware Autosteer has become increasingly prevalent in today's technology-driven era. This advanced technique is employed by robots and autonomous vehicles to effectively navigate and avoid obstacles within a specific directional path. The key to its success lies in establishing seamless communication between the obstacle and the robot, requiring the integration of robust sensors to ensure accurate obstacle detection and avoidance. By incorporating sensor technology, this technique enables autonomous systems to make real- time decisions, ensuring the safety and efficiency of their navigation in the presence of obstacles.

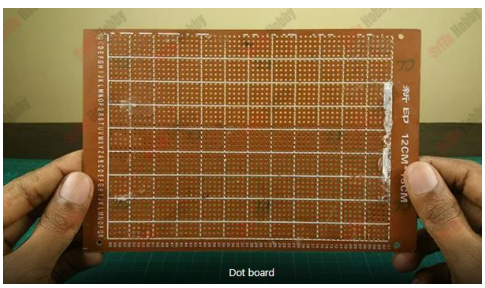
Procedure

Step 1

Firstly, identify these components.

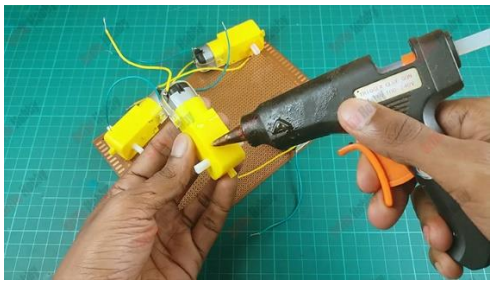


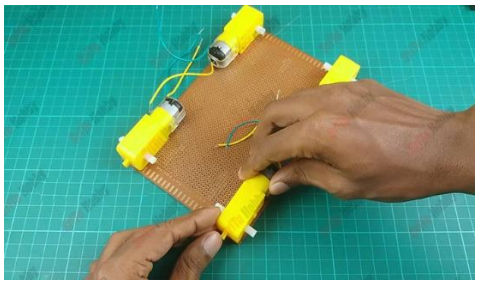




Step 2

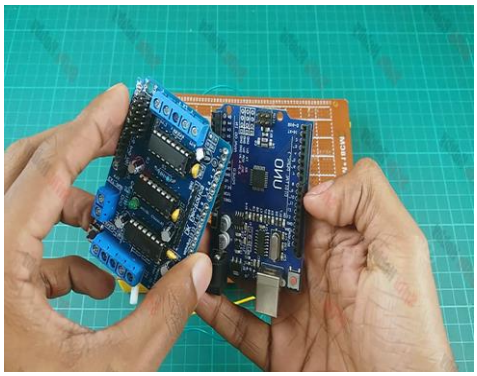
Secondly, glue the gear motors as follows.

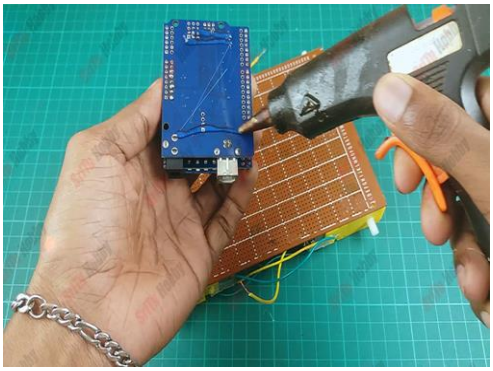


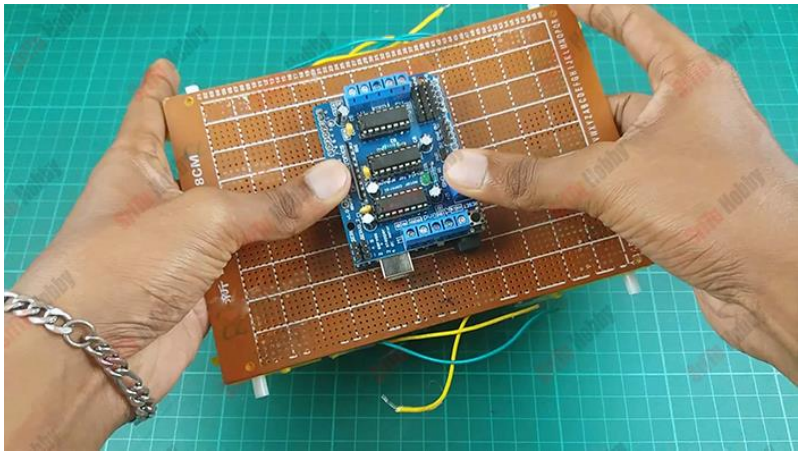


Step 3

Thirdly, connect the L293D motor shield to the Arduino UNO board. Then, glue the top of the dot board.

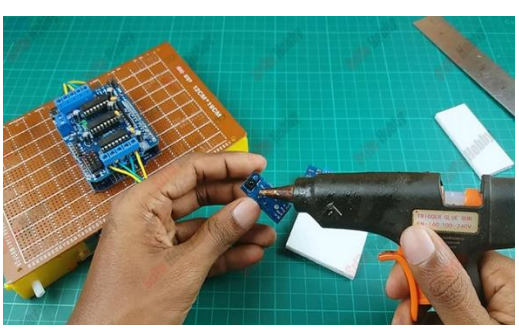


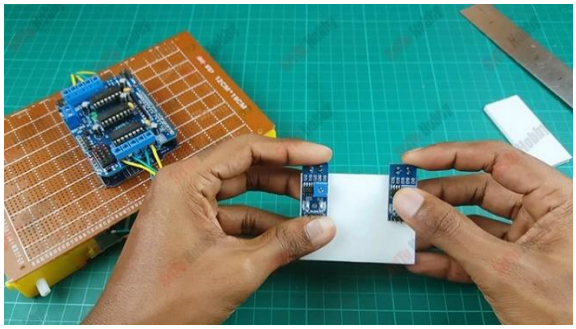


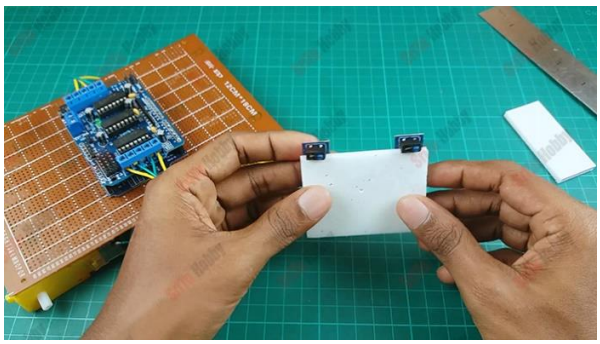


Step 4

Now, glue the two IR sensors to a piece of foam board or cardboard as follows.

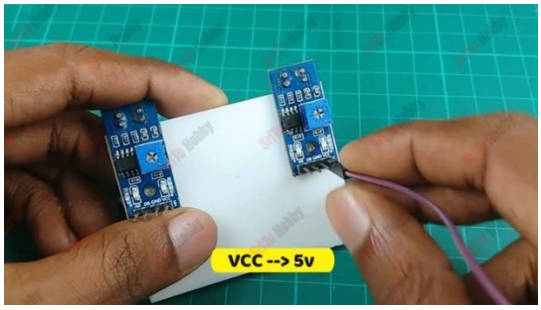


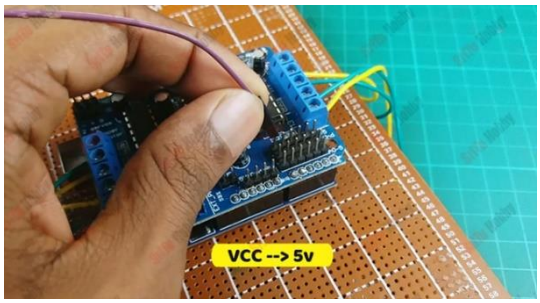


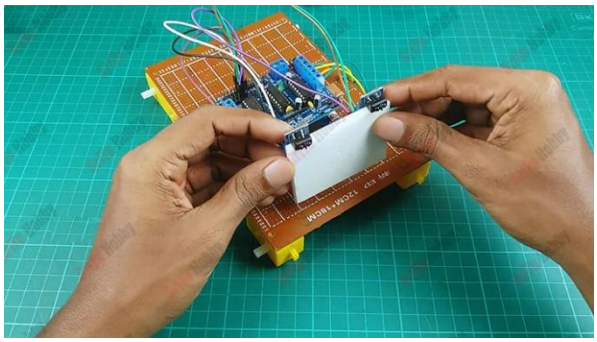


Step 5

Then, connect these sensors to the Arduino board. After, glue it to the dot board.

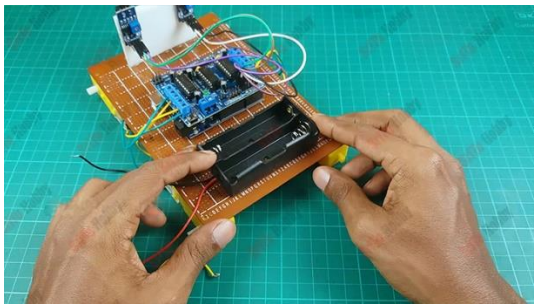


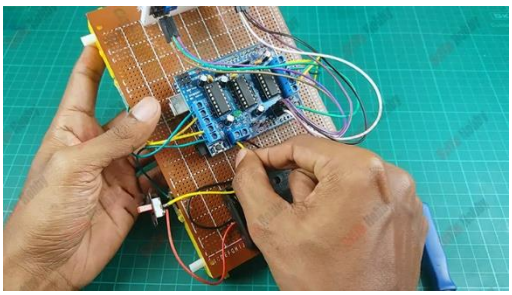




Step 6

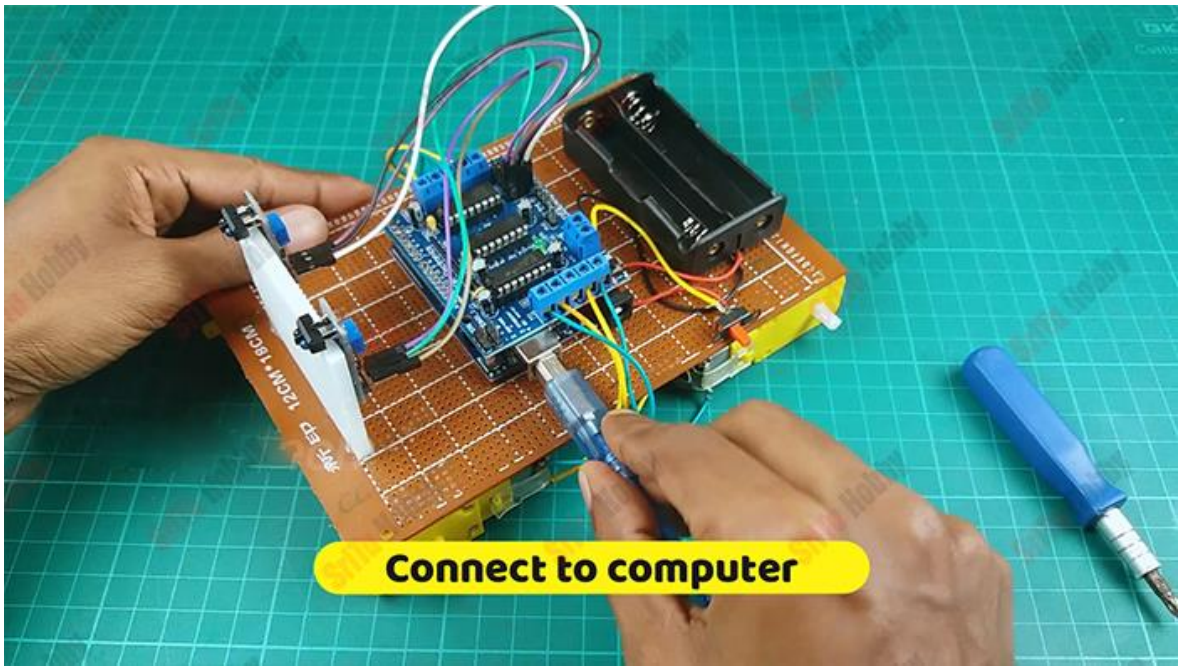
Next, attach the li-ion battery holder to the dot board and connect it to the Arduino board.



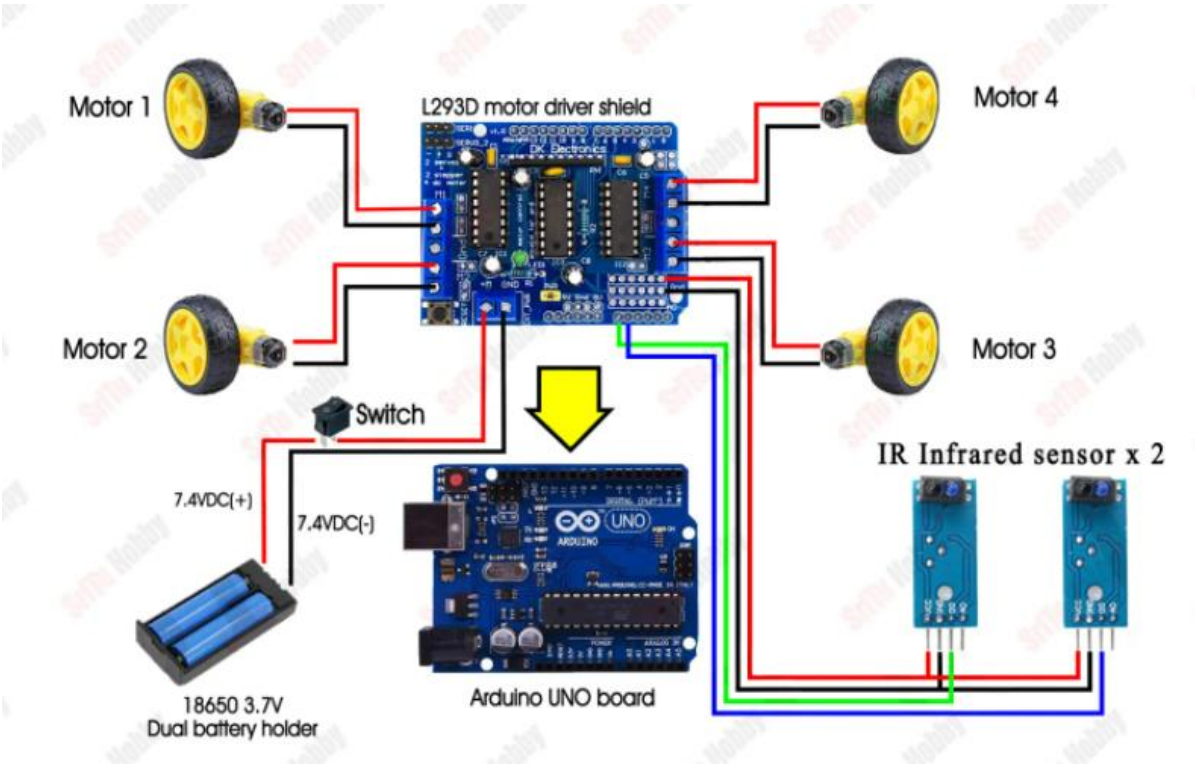


Step 7

Now, connect this robot car to the computer using a USB cable.



Circuit Diagram



Code

```
#include <AFMotor.h>
AF_DCMotor motor1(1);
AF_DCMotor motor2(2);
AF_DCMotor motor3(3);
AF_DCMotor motor4(4);

int Speed = 200;

#define sensor1 A0
#define sensor2 A1

void setup() {
 Serial.begin(9600);
 motor1.setSpeed(Speed);
 motor2.setSpeed(Speed);
 motor3.setSpeed(Speed);
 motor4.setSpeed(Speed);
 pinMode(sensor1, INPUT);
 pinMode(sensor2, INPUT);
}

void loop() {

 bool value1 = digitalRead(sensor1);
 bool value2 = digitalRead(sensor2);
 Serial.println(value2);
 Serial.println(value1);

 if (value1 == 0 && value2 == 0 ) {
  motor1.run(FORWARD);
  motor2.run(FORWARD);
  motor3.run(FORWARD);
  motor4.run(FORWARD);
 } else if (value1 == 1 && value2 == 1) {
  motor1.run(RELEASE);
  motor2.run(RELEASE);
  motor3.run(RELEASE);
  motor4.run(RELEASE);
 } else if (value1 == 0 && value2 == 1) {
  motor1.run(FORWARD);
  motor2.run(FORWARD);
  motor3.run(BACKWARD);
  motor4.run(BACKWARD);
 } else if (value1 == 1 && value2 == 0) {
  motor1.run(BACKWARD);
  motor2.run(BACKWARD);
  motor3.run(FORWARD);
  motor4.run(FORWARD);
 }
```

Conclusion

Robots have become increasingly prevalent in industries, factories, warehouses, and laboratories, playing a vital role in enhancing efficiency and productivity. Their widespread adoption offers several benefits, including a significant boost to the economy. In today's competitive landscape, businesses strive for efficiency to stay ahead of the competition. Robots enable streamlined and automated processes, reducing costs, increasing production rates, and improving overall output quality. By performing repetitive or hazardous tasks with precision and speed, robots free up human workers to focus on more complex and creative endeavors. Ultimately, the integration of robots in various sectors positively impacts the economy by driving growth, optimizing operations, and fostering innovation.

Resources

- **Human following Robot**: https://www.youtube.com/redirect?event=video_description&redir_token=QUFFLUhqbW5jSXh1OEFGQ3loeVRZUzlqWGVSZENSeS1oZ3xBQ3Jtc0trTlIwWUtNOTFIZFNlSTdKaWJKMDlkdUZmVHU1c0pFUDUtWUdWY044V1k4ZjdVdldwYlFZQkpfR0taUjlnS254OHNaam81WmlJZ2tlUU5ySHpmMjI2T0ZaYTAyR1RDQnQzREVkbUlxcDdvbVI4MFdiQQ&q=https%3A%2F%2Fbit.ly%2F3yLpk2m