



Sumo Wrestling

SRB DEMO FILES

ROBOVR - THE OLYMPICS OF ROBOTS

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Introduction

The Sumo Wrestle bot is a four-wheel drive car with the body attached to it and is powered by a minimal number of electrical components, featuring instantaneous response to driver's input. The bot is compact and light, enabling it to traverse through any terrain. The driver can modify various features according to his will, the main objective here is to push the opposition out of the ring.

Requirements

A list of requirements and goals was developed to help guide me in the development of this project. The requirements are as follows.

- The bot shall be controlled by a Bluetooth controller.
- The bot shall be battery powered.

Materials

Arduino Uno R3
HC-05 Bluetooth Module
12V Lithium-ion Battery
L298N Motor Driver Module
DC Motors (300 RPM)
Car Chassis
Servo Motors

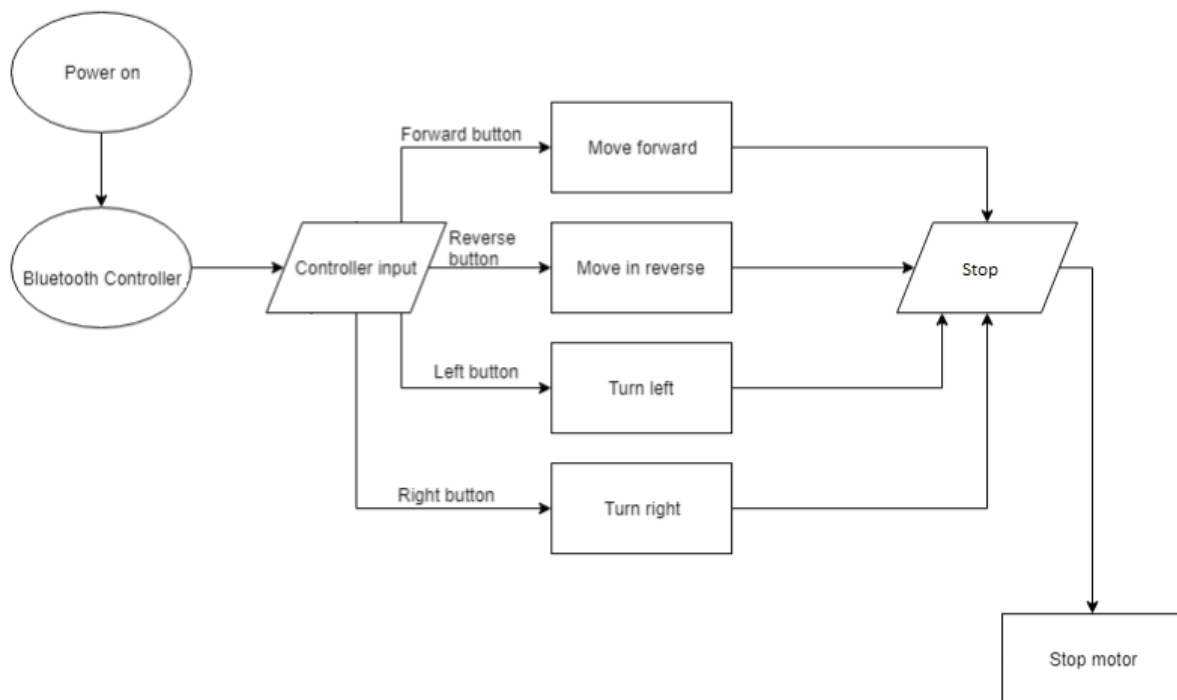
In addition to the hardware used on the arms and the car itself, there was some other hardware necessary to build and the arms of the bot and to run the car. These additional tools included a soldering iron and some solder to assemble the arms of the bot and to assemble RC car and solder wires to the pins connected to the motor batteries. In addition an Android phone is required along with the app "Arduino Bluetooth Control" which can be found in the Google Play Store.

The app has prebuilt symbols, the user just needs to assign various characters (A-Z or a-z) to these symbols and press enter after assigning characters to each symbol.

Once all the required characters are assigned the user should select "switch to controller mode" for connecting the Bluetooth with the Arduino microcontroller.

If asked for a password, the password may be 0000 or 1234 and the name of the Bluetooth module will be HC-05.

Working

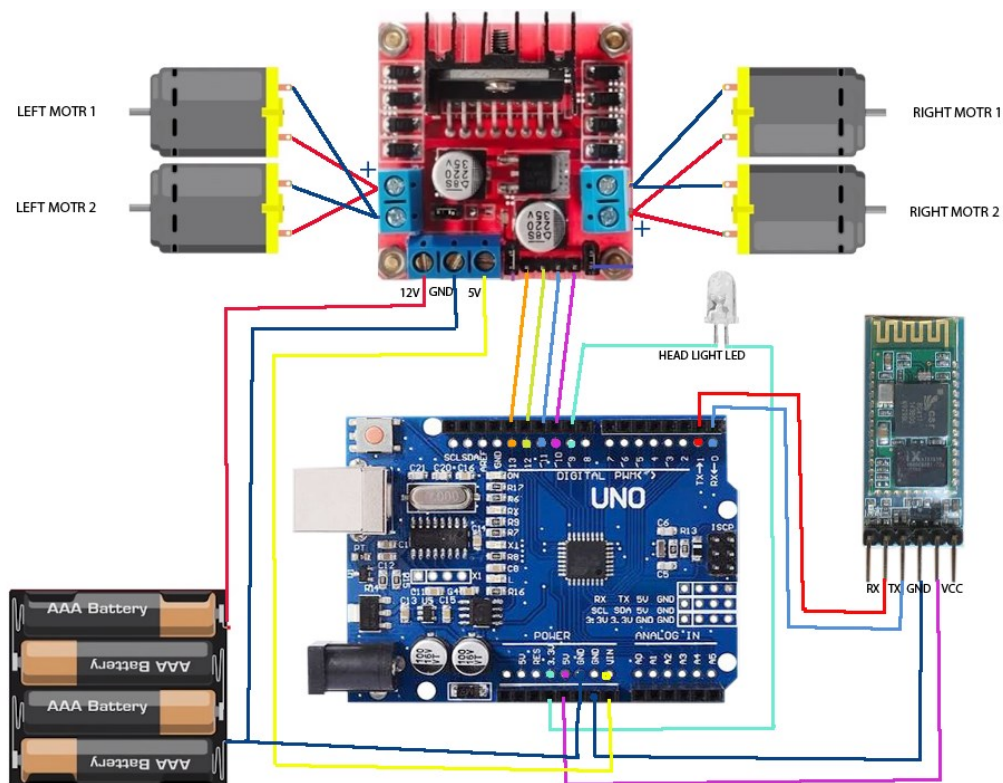


The working of this sumo wrestle bot is based on Arduino UNO microcontroller. The controller is used for communication between various electrical components. The motor driver is connected to the controller and is used to provide sufficient power to the motors connected to it and acts as a medium for communication between Arduino and the motors. The Bluetooth module helps in communicating the desired motion via a mobile application. The predefined code helps to achieve forward, backward, right turn and left turn motion.

NOTE:

When uploading the program to the Arduino the connection to the GPIO pin D0 and D1 had to be temporarily removed until uploading. This became somewhat of a hassle after many times having to upload new code. This must be done since the D0 and D1 pin is used for serial communication between the Arduino and computer.

Circuits and Connections



The circuit connections are quite simple, there is one servo motor connected to a pin of the Arduino module that will be used as control inputs for performing arm movements. The Vcc and Ground pins of the servo motors should be connected to the Vcc and ground pins of the Arduino. The four motors that are used to move the bot are connected to the L298N motor driver module as shown in the figure.

RoboVR Design:



Sample Code

```
char ch='S'; //initially STOP condition
const int IN1=9;// Define RIGHT MOTOR
const int IN2=10;
const int IN3=11;// Define LEFT MOTOR
const int IN4=12;

void setup()
{
  pinMode(IN1,OUTPUT);
  pinMode(IN2,OUTPUT);
  pinMode(IN3,OUTPUT);
  pinMode(IN4,OUTPUT);
  Serial.begin(9600);
}

void loop()
{
  if(Serial.available()) // check if data is available or not
  {
    ch=Serial.read(); // read the incoming byte
  }
  Serial.println(ch);
  if (ch=='R')
  {
    RIGHT();
  }
  if (ch=='L')
  {
    LEFT();
  }
  if (ch=='F')
  {
    FORWARD();
  }
  if (ch=='B')
  {
```

```

BACKWARD();
}
if (ch=='S')
{
STOP();
}
}
void FORWARD(){
Serial.println("forward");
digitalWrite(IN1,HIGH);
digitalWrite(IN2,LOW);
digitalWrite(IN3,LOW);
digitalWrite(IN4,HIGH);
}
//-----
void BACKWARD(){
Serial.println("backward");
digitalWrite(IN1,LOW);
digitalWrite(IN2,HIGH);
digitalWrite(IN3,HIGH);
digitalWrite(IN4,LOW);
}

//-----
void LEFT(){
Serial.println("LEFT");
digitalWrite(IN1,LOW);//MOVING RIGHT MOTOR IN CLOCKWISE DIRECTION
digitalWrite(IN2,HIGH);
digitalWrite(IN3,LOW);//MOVING LEFT MOTOR IN ANTICLOCKWISE DIRECTION
digitalWrite(IN4,HIGH);
}
//-----
void RIGHT(){
Serial.println("RIGHT");
digitalWrite(IN1,HIGH);//MOVING RIGHT MOTOR IN ANTICLOCKWISE
DIRECTION
digitalWrite(IN2,LOW);
digitalWrite(IN3,HIGH);//MOVING LEFT MOTOR IN CLOCKWISE DIRECTION

```

```
digitalWrite(IN4,LOW);
}
//-----
void STOP(){
Serial.println("stop");
digitalWrite(IN1,LOW);
digitalWrite(IN2,LOW);
digitalWrite(IN3,LOW);
digitalWrite(IN4,LOW);
delay(100);
}
```

Uses and Applications

This particular Robot is basically like a Remote Controlled 4-Wheel Drive Vehicle which is controlled via Bluetooth through an Android Device. This Robot covers your fundamental knowledge about controlling Motors with a Arduino Microcontroller specifically a Uno R3.

These Robots can be amazingly improved by including the use of Proximity sensors like Ultrasonic Sensors and Infrared Sensors, to actually automate the Gameplay. It will basically work like if the opponent (Obstacle for the sensors) are in the vicinity, it will move towards it and try to punch the opponent(obstacle) out of the match ring.