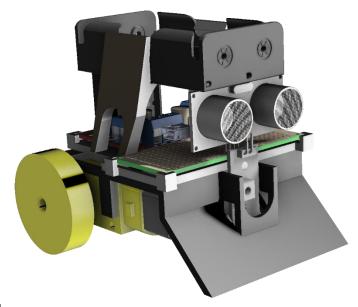
#### **Sumo-Bot CRF edition**



### **Background**

The name "sumo" is from an old Japanese sport consisting of two opponents fighting in a ring. The goal is to push each other out of the ring. In robot sumo, two robots is competing against each other.

Sumo is divided into several classes with specific weight and measurements. This kit is for a "mini" sumo. With rules:

- 1. Maximum outer dimensions: 10x10 cm
- 2. Maximum weight: 500g
- 3. The robot shape could be changed after start.
- 4. Must be self-controlling.

The contest ring is designed in a certain way for each class and have two colors. Black with a white frame.

### **Component and Use**

Arduino Nano (copy)  Main board micro processor which is controlling all parts with code.	
DC motor with wheel x2	

# Motor driver L298N Dual H bridge Provides constant voltage to the motors and can be controlled with the Arduino **Ultrasonic sensor HC-SR04** Measuring distance with sound and is used to locate the opponent. IR sensor TCRT5000 Makes the robot able to spot if it is on the black or white part of the contest ring. Lithium battery 18650 x2 Supplies Arduino and motor driver with voltage. **Jumper wires** Some wires between different parts of the robot. **3D-printed frame** Holds the sumo-bot together

#### Strategy

There are loads of different strategies. The example code of this robot kit is one of the most basic.

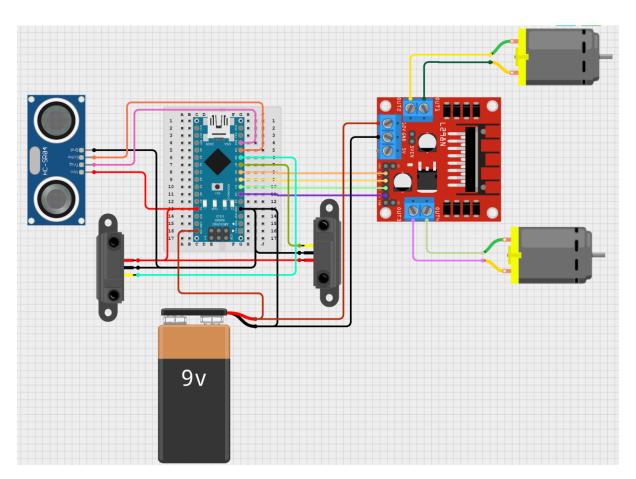
Five seconds after connecting power cables, the robot will start rotating.

And if the opponent is found in a given range found by the ultrasonic sensor it will attack. Which means stop rotating and going forward against the opponent and try to push it off the contest ring. If

If the opponent moves out of the way, rotating will be applied.

The robot will go forward if the IR-sensor in the back discovers a white line, and backward if the frontal IR-sensor detects white line.

#### **Conceptual Circuits**



#### **Pinout Scheme**

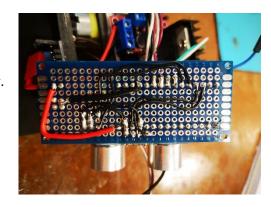
Purpose	PINout Arduino
Trig on Ultrasonic	D10
Echo on Ultrasonic	D9
IR-sensor out front	D8
IR sensor out back	D7

Motor driver IN 1	D6
Motor driver IN 2	D5
Motor driver IN 3	D4
Motor driver IN 4	D3

### **Before building**

You get to choose between two kits.

One with a presolderd circuird board ready to be put together.



And one with some soldering on a experimental board required. Guidelines and tips for this will be found beneath the building guide.

The following building guide is based on a presolderd board.

### **Building step by step**

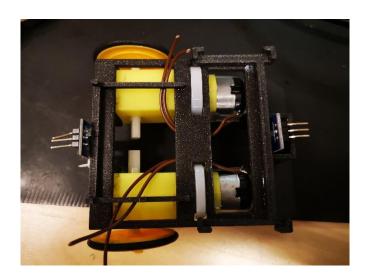
Parts included:

## Step 1

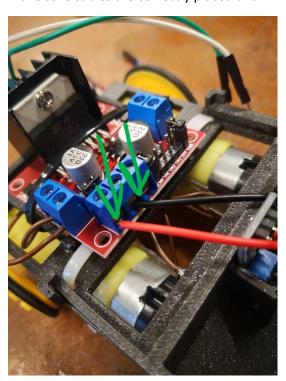
Attach IR-sensors to frame with included zip ties.

### Step 2

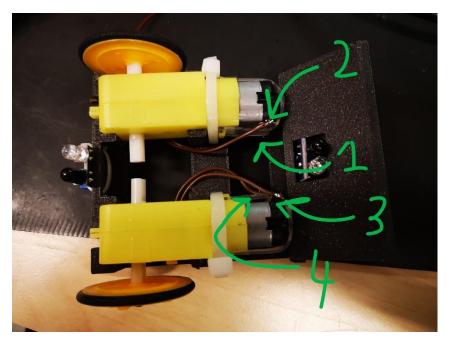
Assembly wheels to DC motors and attach to frames with zip ties.

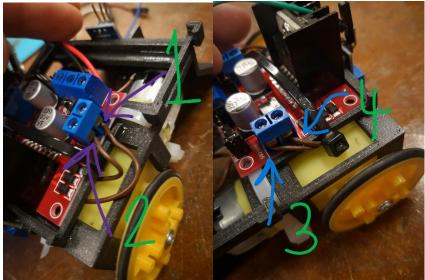


Step 3
Insert motor driver and circuit board with Arduino as shown.
Make sure cables are correctly placed and firmly fastened.



**Step 4**Fasten cables from DC motors to motor driver.





Fasten cables from battery to circuit board.

# Step 5

Click in battery casing with batteries placed inside, put zip tie around.

## Step 6

Place ultrasonic sensor.