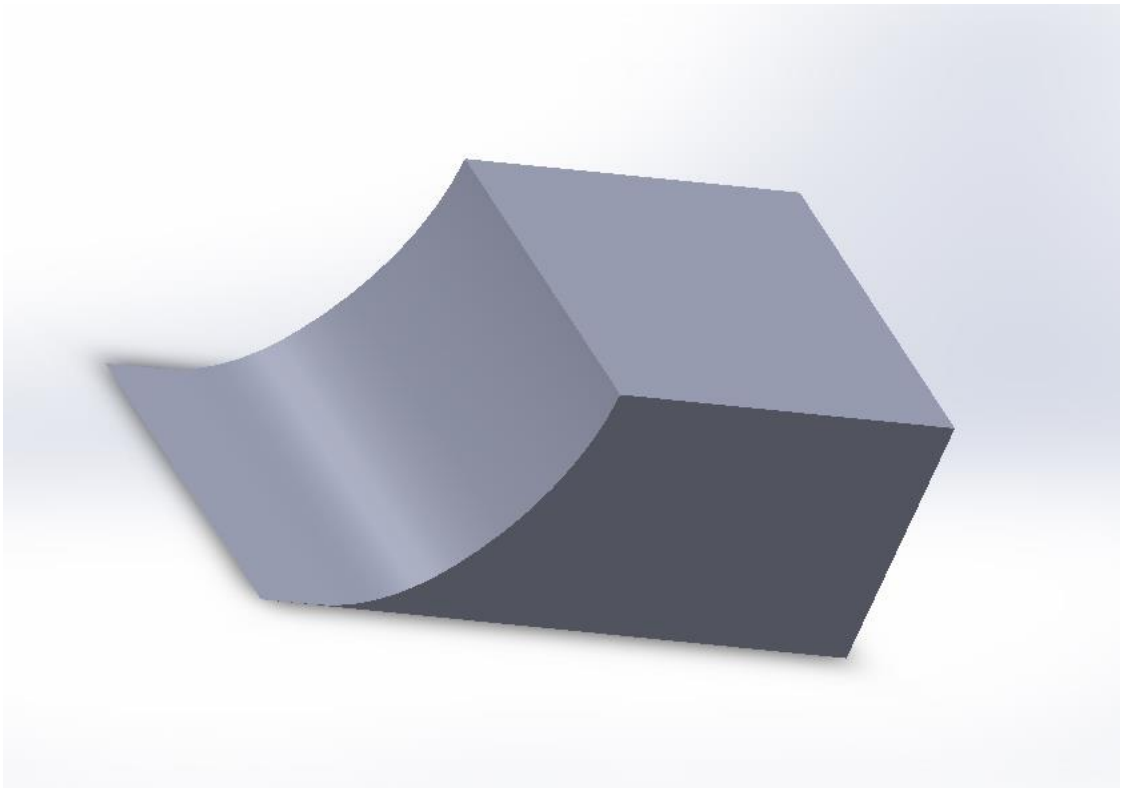
Technical file of « Nameless »



Work done by :

Meher Marweni

Mohamed Aziz Tousli

Contents

1. Description :

Our robot, named "Nameless", is a medium size vehicle with four wheels, two main and two secondary, activated by two geared motors. It is controlled by a programmable electronic card to which can be added a module to adjust the motors and a receiver to control it.

And like any sumo robot, it has two plates, forward and backward, to push the other robots out of the circle, to defend against the opponents and to protect the electrical circuit, which is located above a horizontal main plate.

"Nameless" will be able to finish the race, at first, since it will be remote controlled by a controller, and eliminate other robots, at second, thanks to the strength of its engines, and the hardness of its aluminum plates.

2. Electronic part :

a. Electronic components :

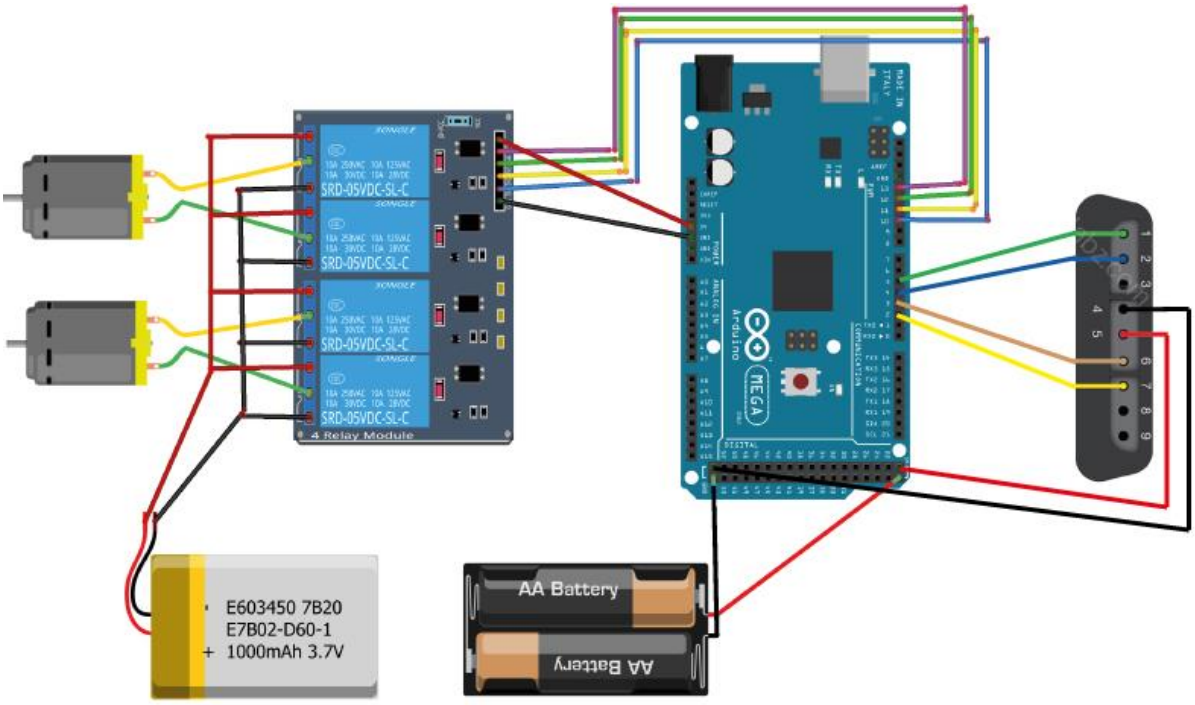
The table below lists the various electronic components used throughout the preparation of the robot:

Component name	Component function	Component Figure
Arduino Mega board	Program the electrical circuit	
4 relay module	Control the motors	
2 free wheels*	Keep the balance of the vehicle	
2 wheels with tires*	Fix the vehicle on the ground	

PS2 wireless controller	Teleguide the vehicle	
Emergency stop button	Stop the whole system	
Power Bank	Power the Arduino board	
12V battery	Power the 4 relay module	

b. Electrical circuit :

We modeled the electrical circuit of our robot thanks to the Fritzing software:



3. Mechanical part :

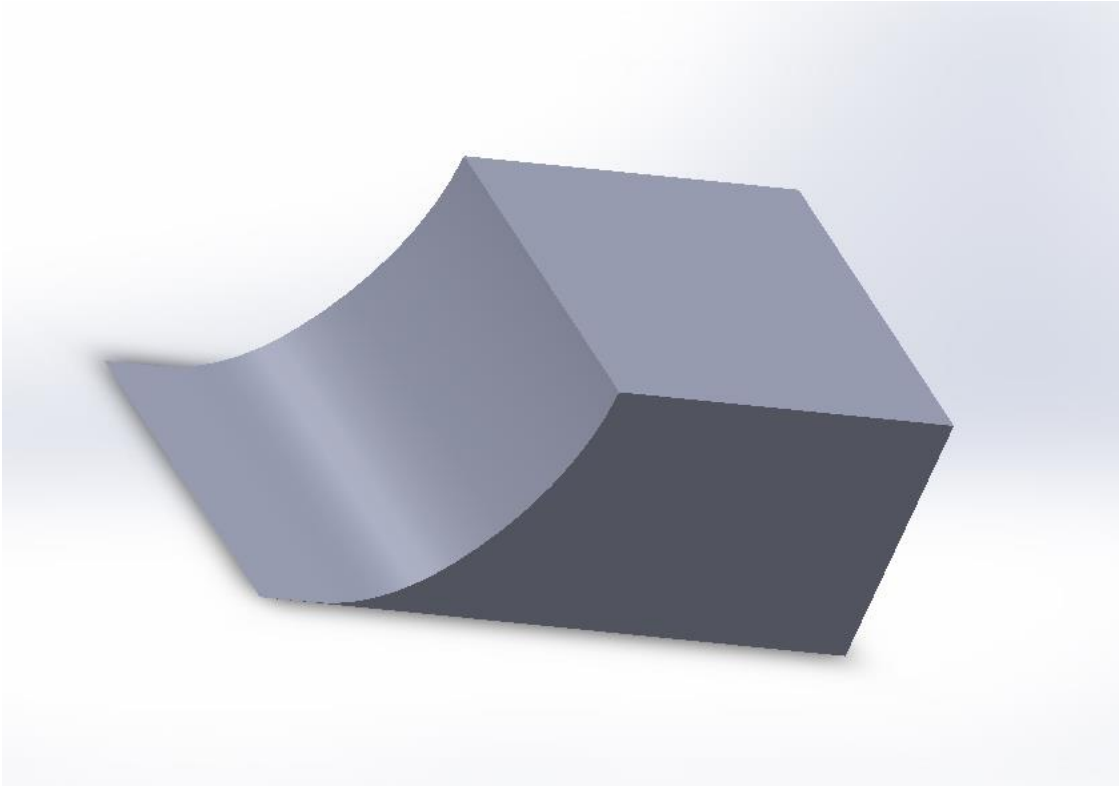
a. Material used :

In order to guarantee the strength and the hardness of our robot, we built it based on aluminum, which is cheap and available. With the help of a blacksmith, we could create the model that we wanted: an aluminum carcass composed of three main parts:

- A curved plate bent forward
- A shorter curved plate bent backward
- A horizontal plate where the electronic components are located

b. Mechanical concept* :

We made the mechanical model of our robot thanks to the SolidWorks software:



*The model was planned to be like this, but the blacksmith suggested another model.

4. Programming part :

To program the Arduino board, we used the Arduino software provided for this purpose. The code was not difficult to write. We have imported the library already ready "PS2_X.lib", to connect between the PS2 controller and the Arduino board. Five functions have been inserted: forward, backward, right, left and stopp.

The main program is presented below:

programme_sumo §

```
55
56    if(ps2x.NewButtonState()) {
57       if(ps2x.ButtonPressed(PSB_PAD_UP))
58          forward();
59       if(ps2x.ButtonReleased(PSB_PAD_UP))
60          stopp();
61       if(ps2x.ButtonPressed(PSB_PAD_RIGHT))
62          right();
63       if(ps2x.ButtonReleased(PSB_PAD_RIGHT))
64          stopp();
65       if(ps2x.ButtonPressed(PSB_PAD_LEFT))
66          left();
67       if(ps2x.ButtonReleased(PSB_PAD_LEFT))
68          stopp();
69       if(ps2x.ButtonPressed(PSB_PAD_DOWN))
70          backward();
71       if(ps2x.ButtonReleased(PSB_PAD_DOWN))
72          stopp();
```