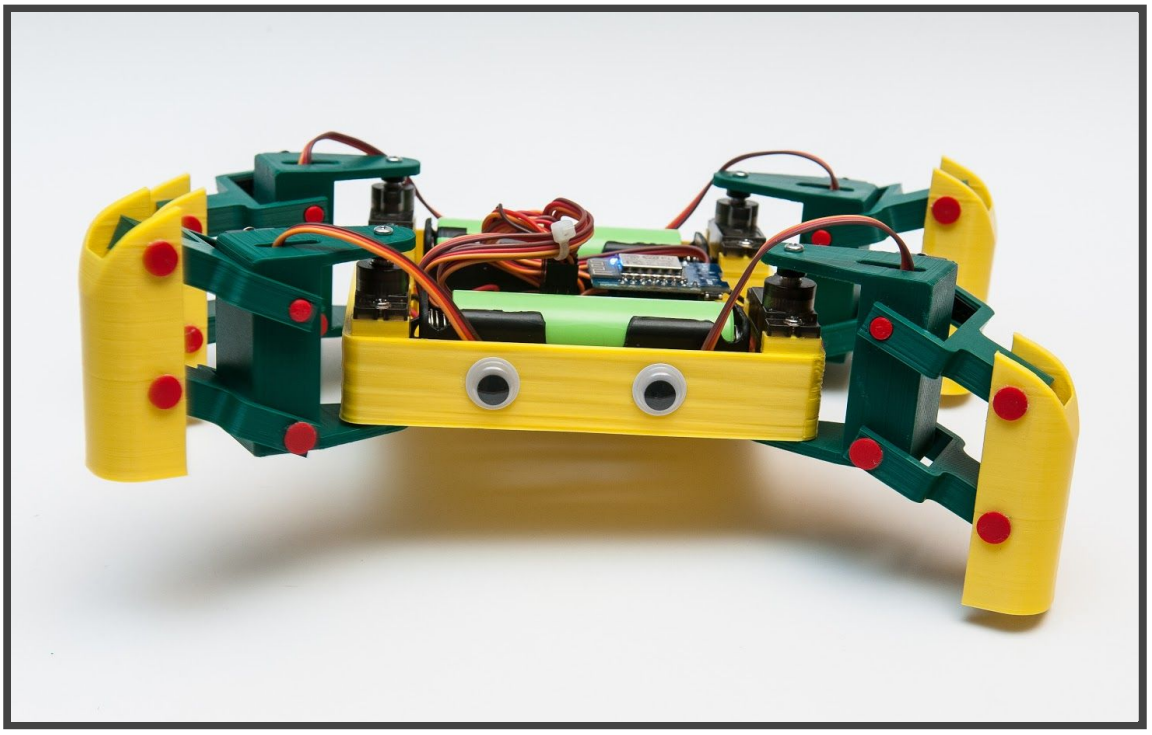
KANI



The Quadruped robot

Frédéric JELMONI
September 2019

Version 1.0

Content

Introduction

KANI is a close cousin of **KAME**, another quadruped robot that we can discover here : https://www.thingiverse.com/thing:1265766

A big thank-you at bbq3D (https://www.thingiverse.com/bq3D/about) for his project and his inspiration.

But, KANI project is characterized by some interesting notes :

➔ All the parts have been completely redesigned to facilitate 3D printing :
- in PLA,
- without support structure,
- without adhesion border

➔ The source files are available in the format :
- f3d (Autodesk Fusion360)
- obj (3D format for import/export)
- stl (for 3D printing)

➔ Any screws aren't needed for mounting articulation

➔ The robot is designed around a ESP8266 and 8 servo motors type MG90S, in metal, robust and cheap

➔ The set is powered by 2 Lithium battery NCR18650B 3,7V 3400mAh and a 5V UBEC regulator

All documentation, 3D files, source code, diagrams, photos, is available here : https://github.com/FredJ21/KANI_Quadruped_Bot

Realization of mechanical parts

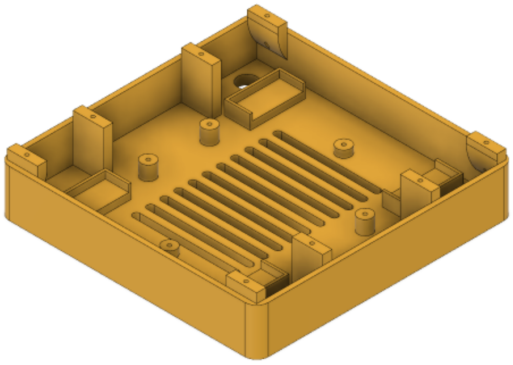
The mechanical parts are made of PLA 3D printing, without support structure and without adhesion border.

The assembly axes are also made in 3D printing.

STL files are available here:

https://www.thingiverse.com/thing:3874202

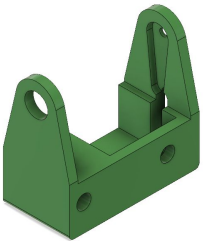
Parts list



Body

File name: Body.stl

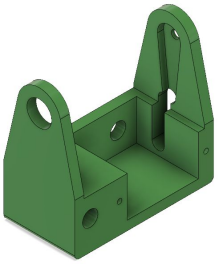
Quantity : 1



Leg support 1

File name: Leg_support_1.stl

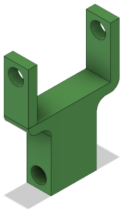
Quantity : 2



Leg support 2

File name: Leg_support_2.stl

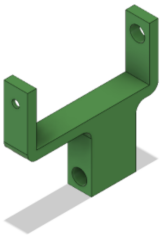
Quantity : 2



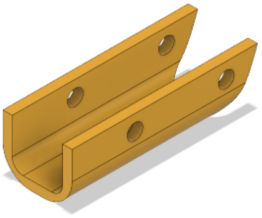
Lower articulation

File name: Lower_Articulation.stl

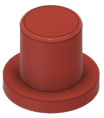
Quantity : 4



Upper articulation
File name: Upper_Articulation.stl
Quantity : 4



Leg
File name: Leg.stl
Quantity : 4

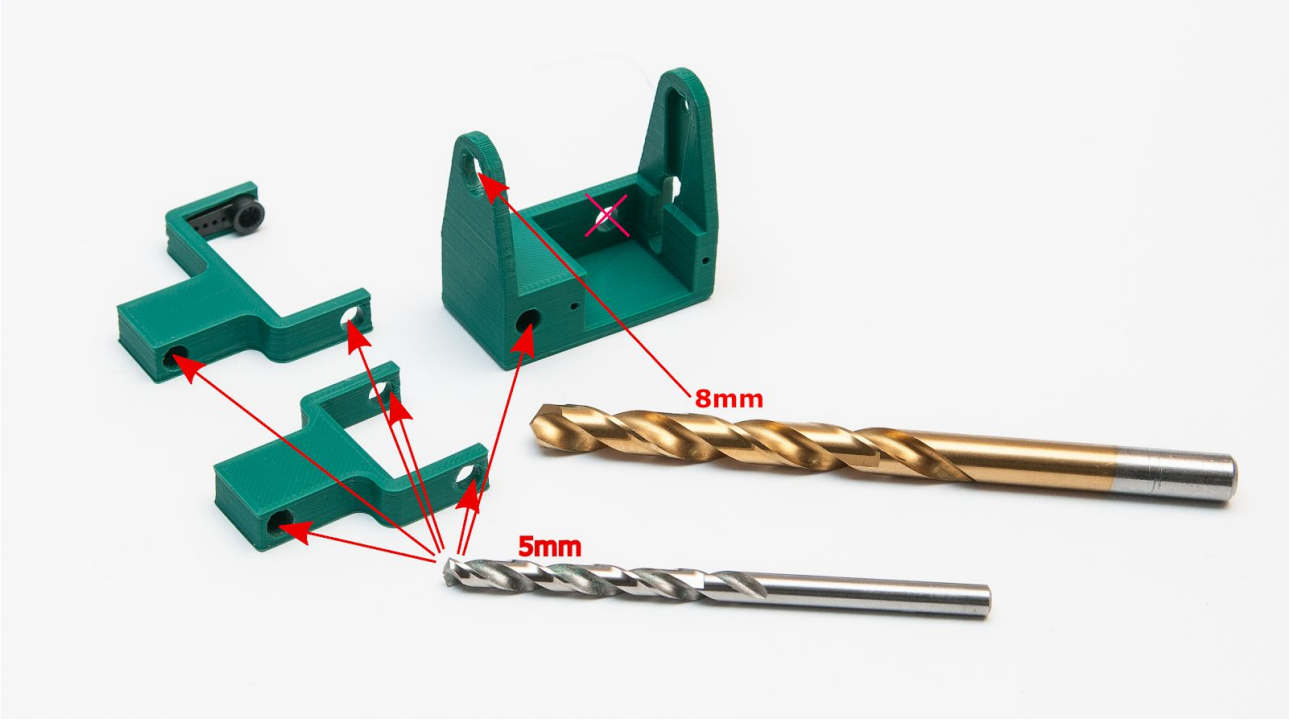


Axle 8 mm
File name: Axle_8.stl
Quantity : 4

Axle 5 mm
File name: Axle_5.stl
Quantity : 28

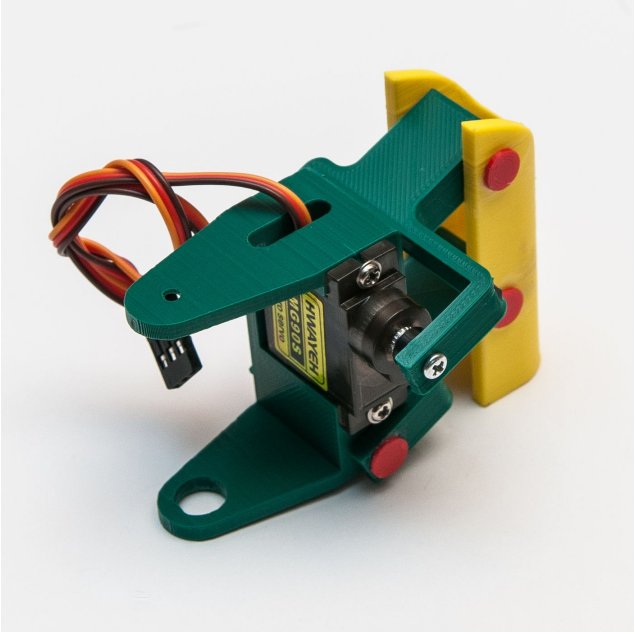
Preparation of parts

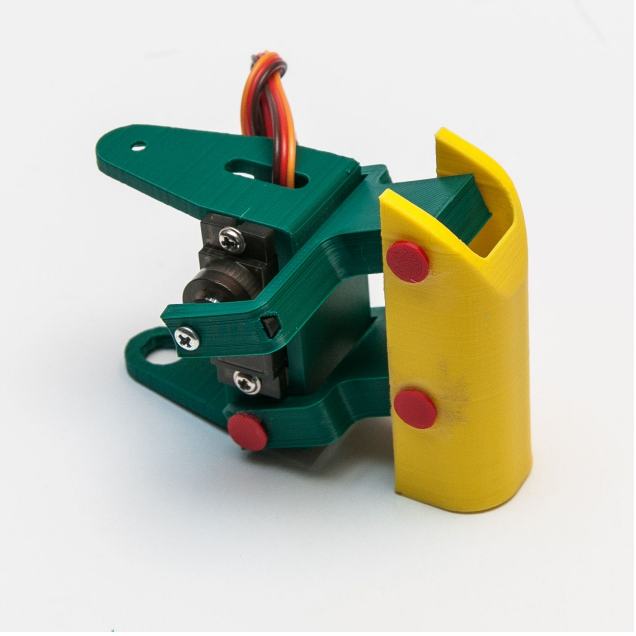
In order to obtain a low mechanical resistance during leg movements, some parts must be re-drilled using a 5 mm or 8 mm drill bit.



Legs assembly

The 5mm shafts are mounted with a slight dot of glue just below their head.

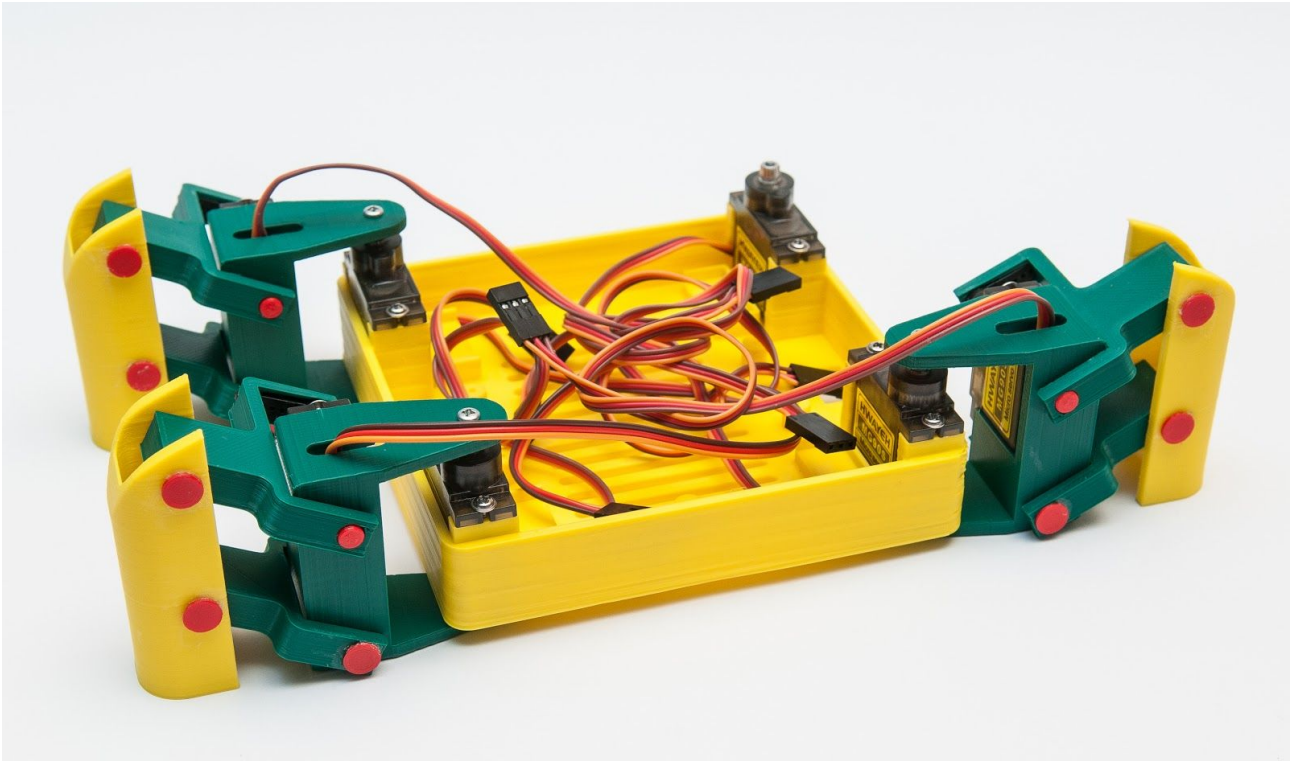




Body assembly

The 8mm axes are placed in the body, under the servo motors, without glue.

Setting up legs :



Electronic Realization

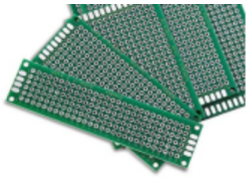
Parts list

ESP8266 Wemos D1 Mini
https://fr.aliexpress.com/item/32651747570.html

8 Servo Motors MG90S
https://fr.aliexpress.com/item/32970918454.html

Regulator UBEC 5v 3A
https://fr.aliexpress.com/item/32574612952.html

2 Battery holders 18650
https://fr.aliexpress.com/item/32847794157.html



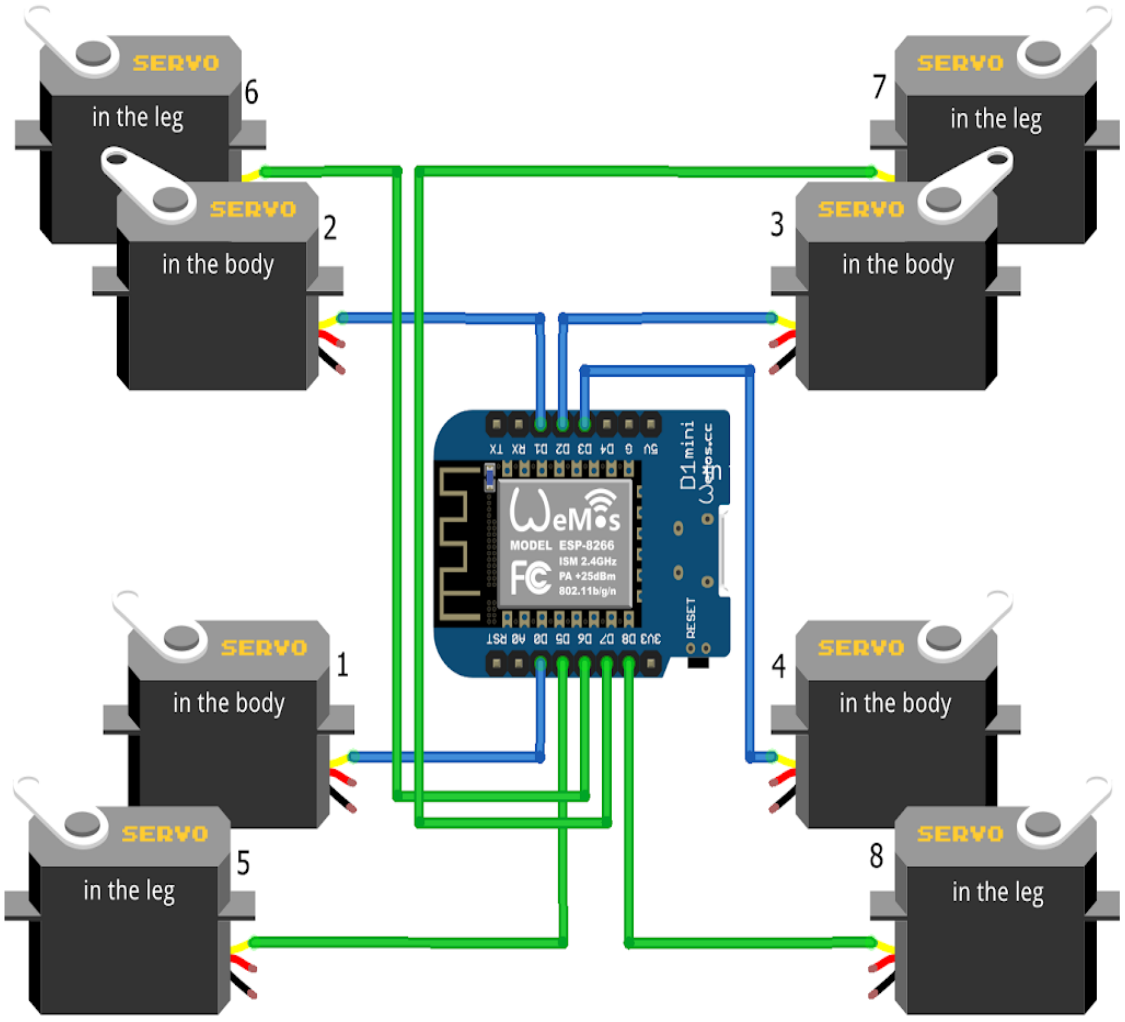
PCB 3 x 7 cm
https://fr.aliexpress.com/item/32759438462.html

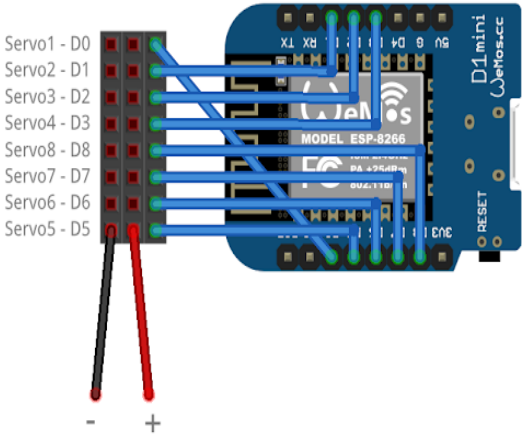
2 Battery Lithium NCR18650B 3.7 v 3400mah
https://fr.aliexpress.com/item/32324914059.html

Quadruped Robot

Fred J. 08/2019

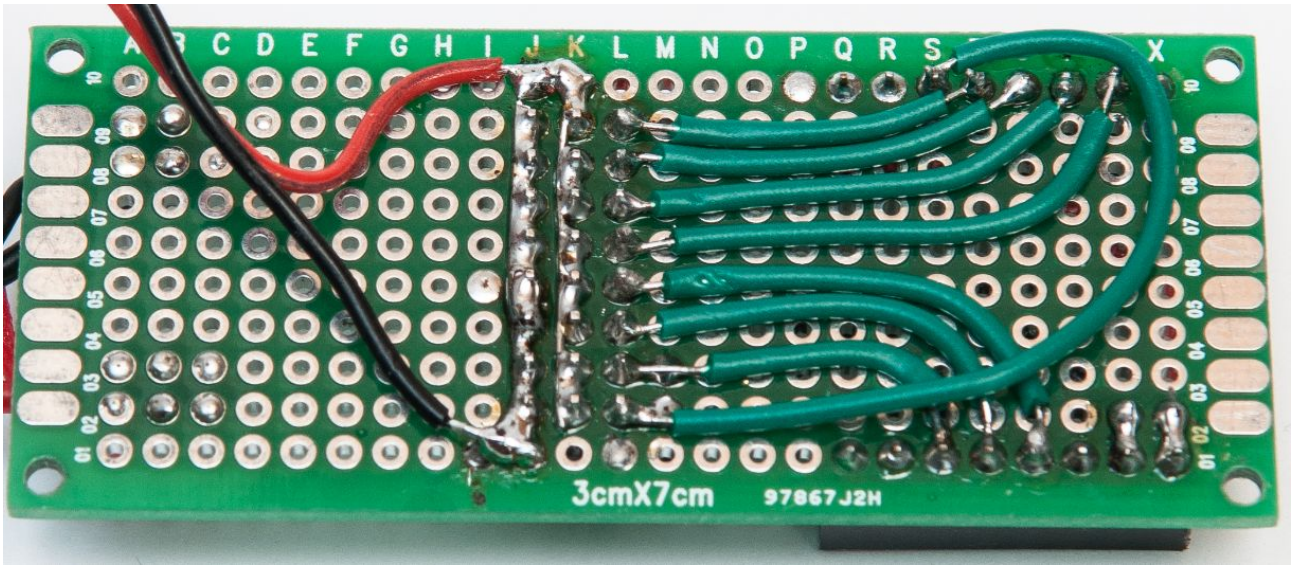
Diagram

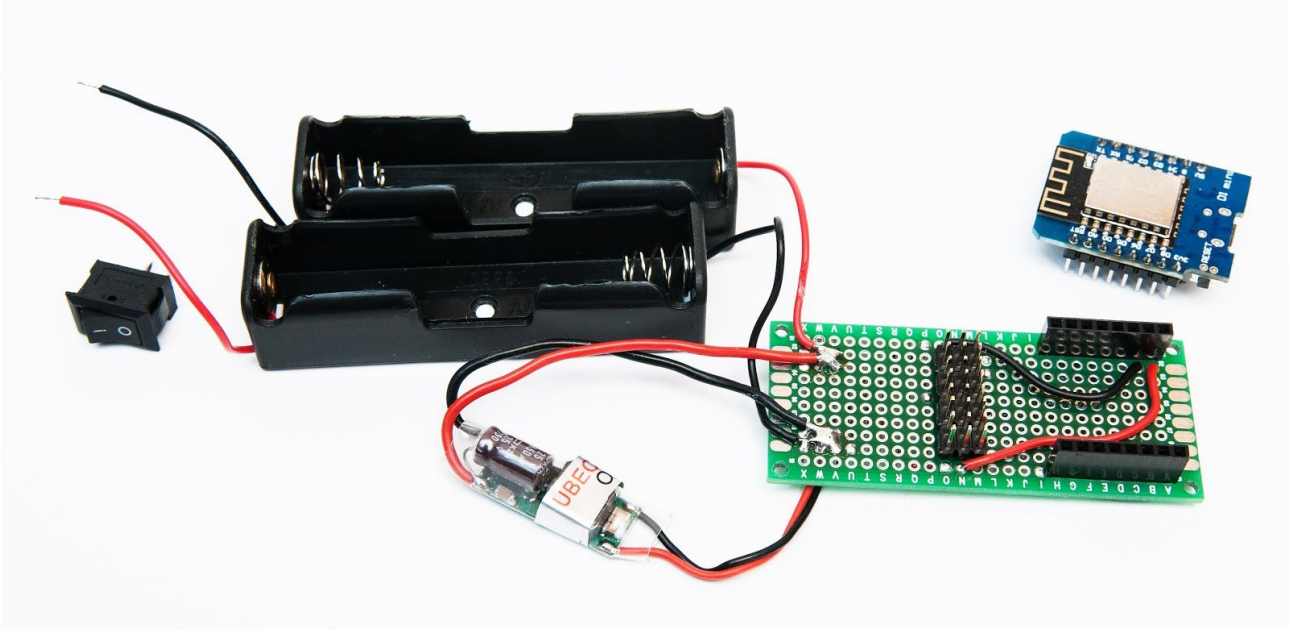




fritzing

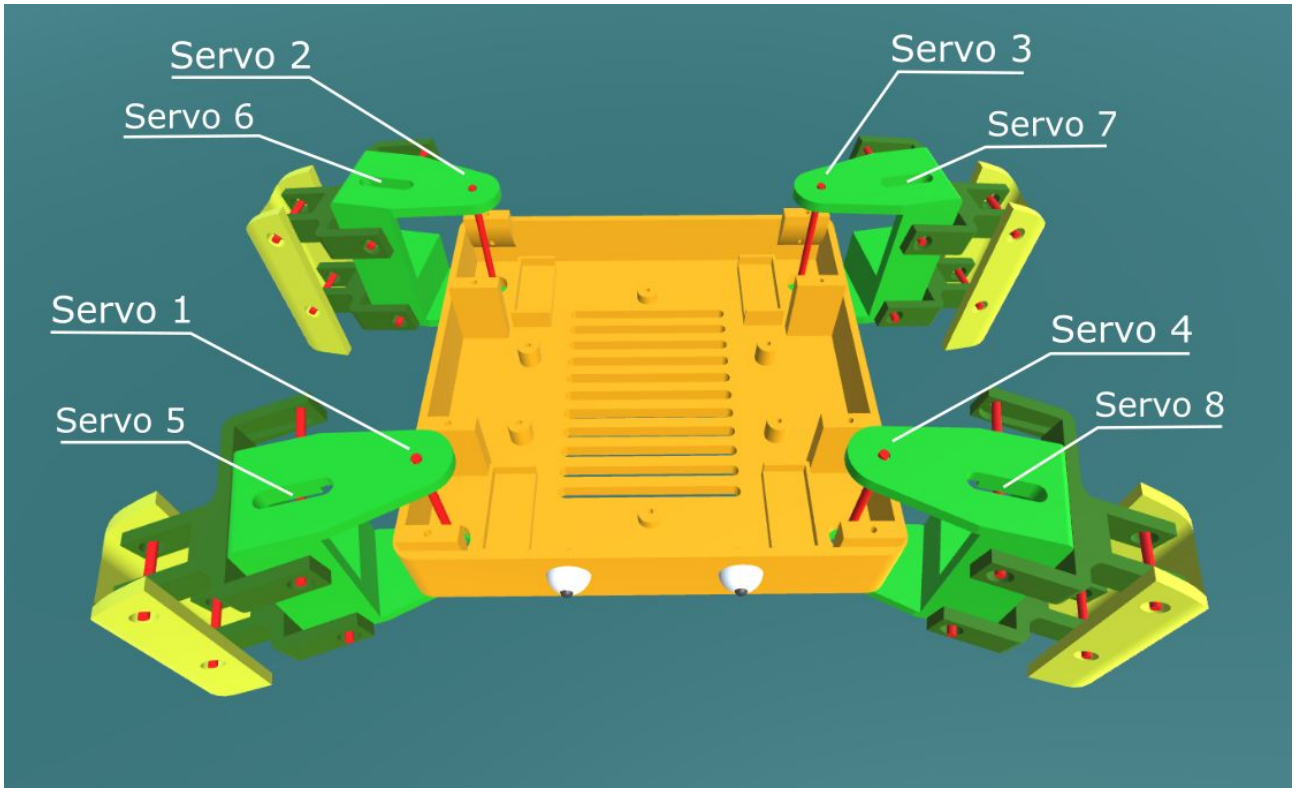
Realization of the circuit





Motor connection

The servo motors are numbered from 1 to 8 with respect to the front of the robot.



The wiring of the servomotors is realized as follows: