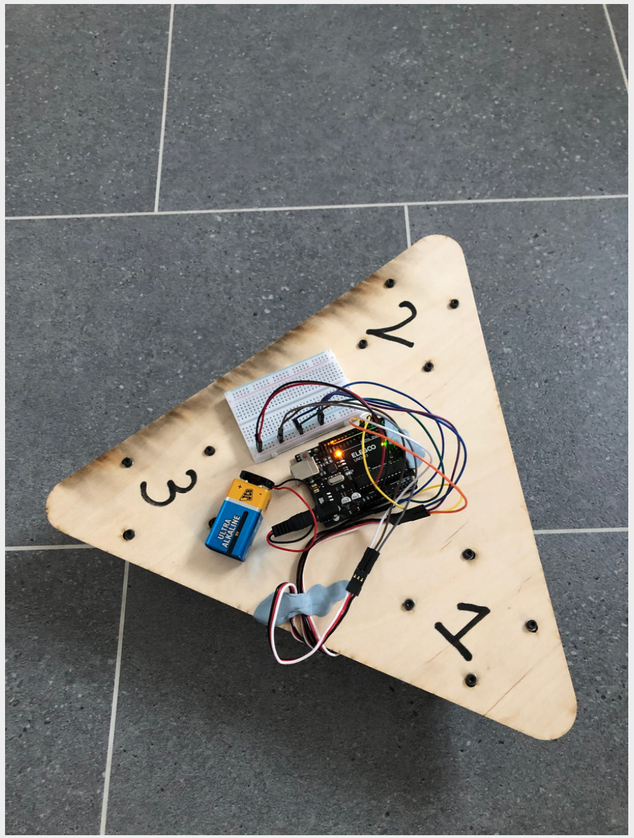
3 Wheel Omnidirectional Arduino Board

Presentation

Introduction

This project will be controlled by an Arduino and will move using three omnidirectional wheels, which will be powdered using a continuous rotation servo motor attached to each wheel.

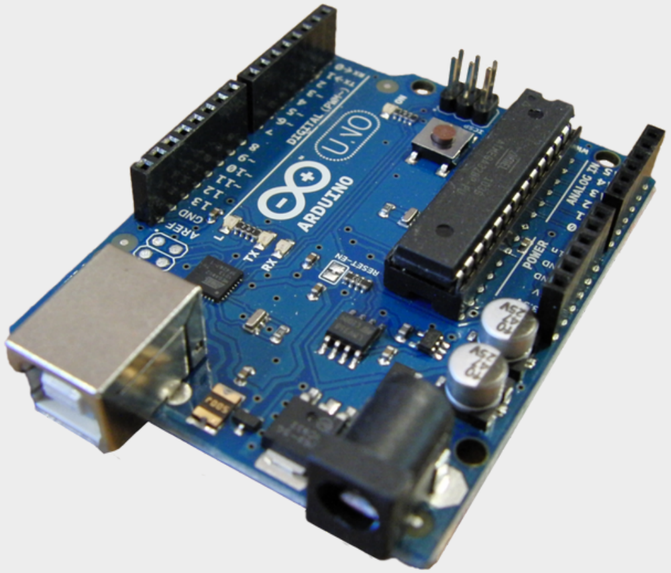


How does it work?

- By connecting all the circuits and wires to the Arduino board and continuous rotation servo motors.
- Then sends a set of code to the Ardunio, which will power the continuous rotation servo motors to move the omnidirectional wheels at a certain speed.
- Either clockwise or anticlockwise, assigned by the set of code.

What is an Arduino?

An Ardunio is a control device that incorporates a microprocessor, enabling it to read inputs such as:



- Light on a sensor
- Finger on a button
- Soil moisture levels

Turn them into outputs:

- Activating a servo motor
- Turning on an LED lights

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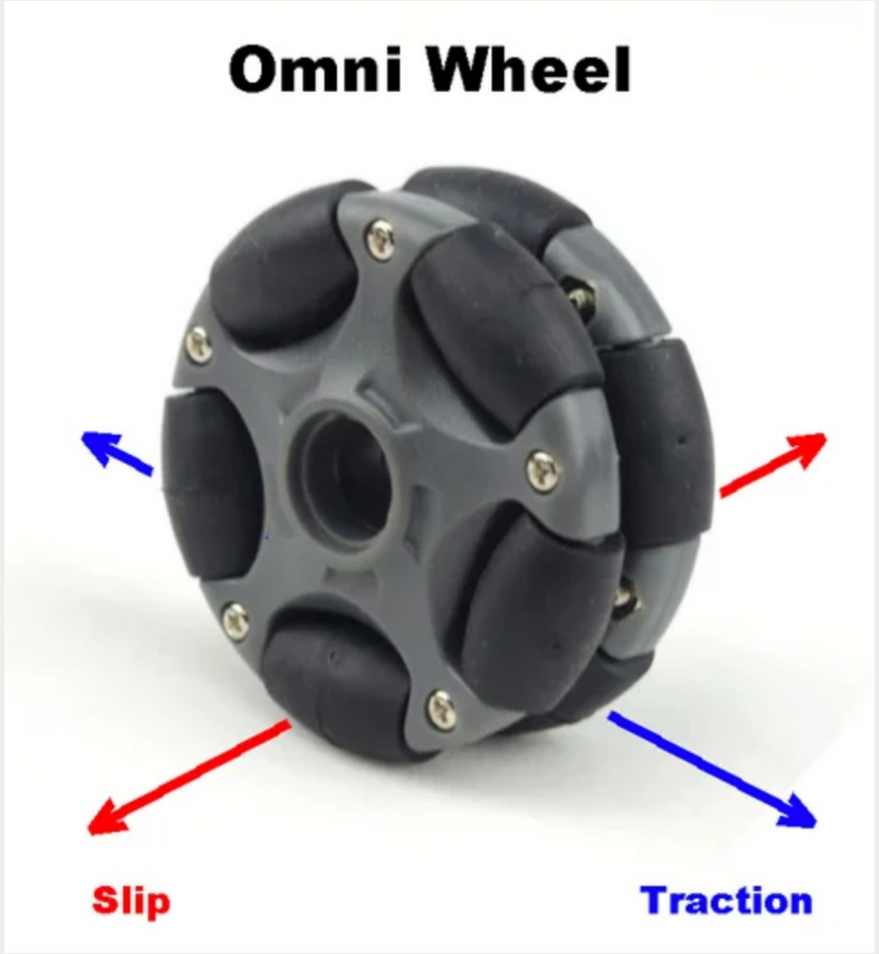
Understanding of Omnidirectional wheels

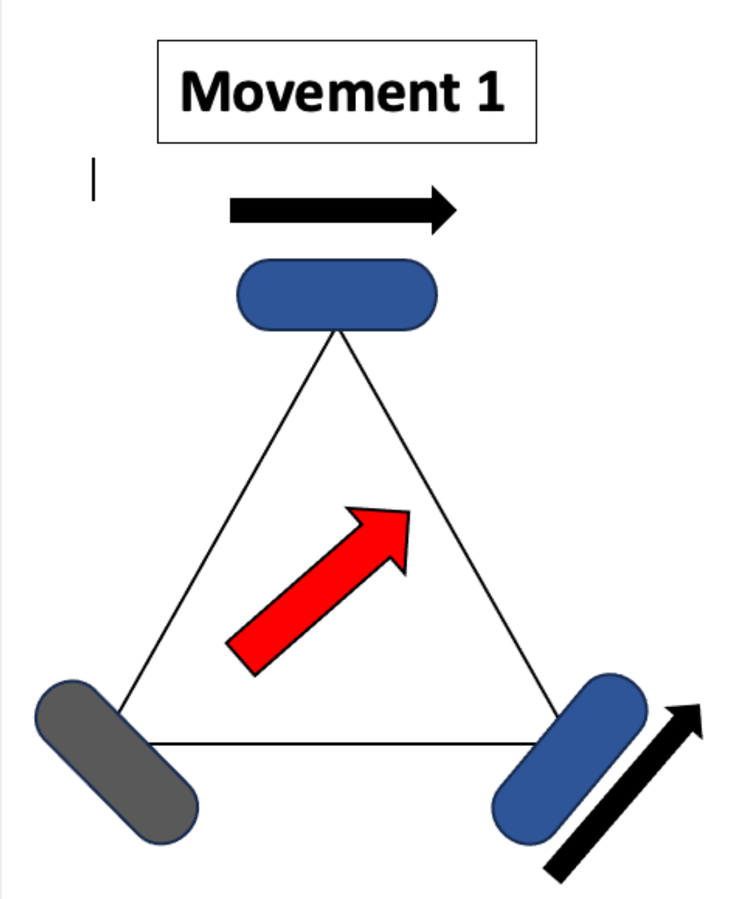
- Omni-wheels are engineered to have special rollers mounted at an angle around their circumference.
- Enables them to roll not only forward and backward but also sideways.

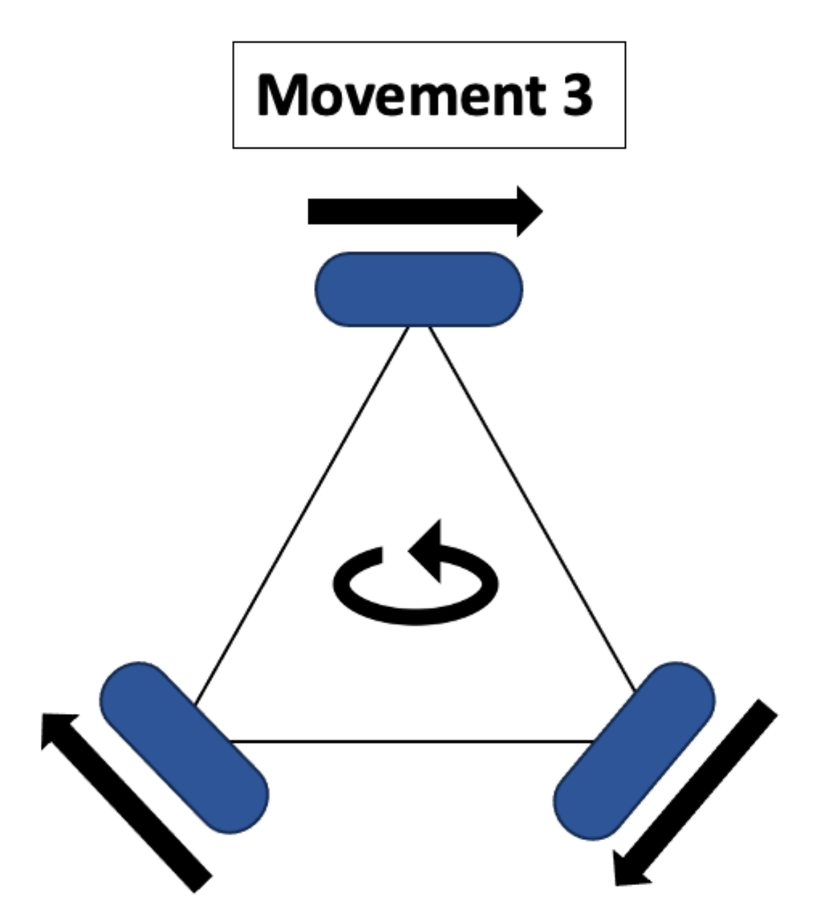
Wheel mechanics



- The way it moves forward and backward is when the central axis rotates in the forward or backward direction, and then the rollers are designed to roll freely in the same direction, just like a conventional wheel.
- The way it moves sideways if the oblique force causes the wheel to move sideways.

Example of Oblique Force

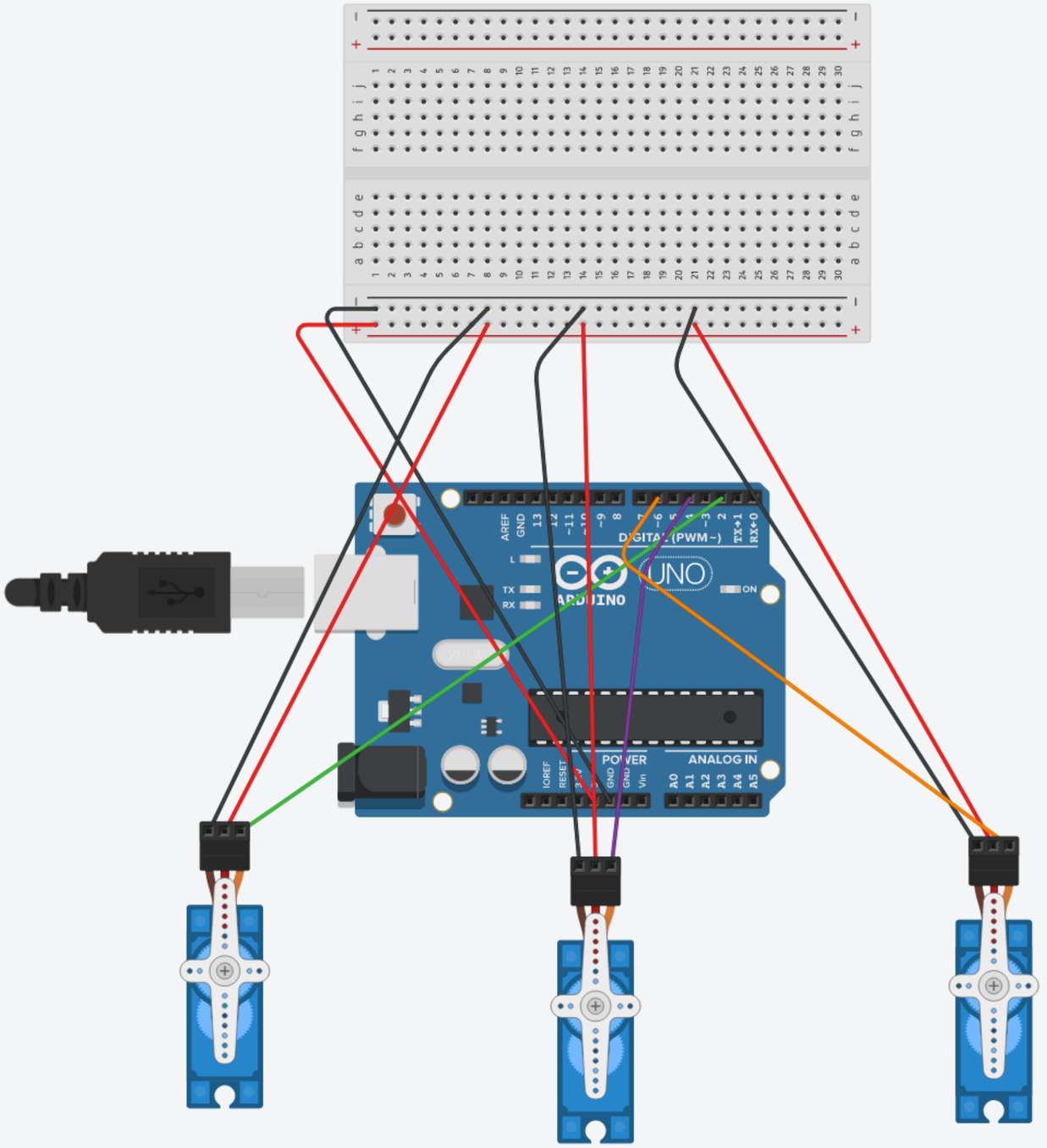




Continous Rotation Servos

- A Continuous rotation servo can go through multiple complete rotations. As it changes direction and speed, the command signal you send to the Arduino is now controlling the servo speed and uses the same number between 0 and 180.
- Placing the value at 0 will make the motor spin full speed clockwise. When you place the value at 180, it will make the motor spin full-speed anti-clockwise. When you set it to 90, the motor will stop, as the value is controlling the speed of the motor, not the angle.

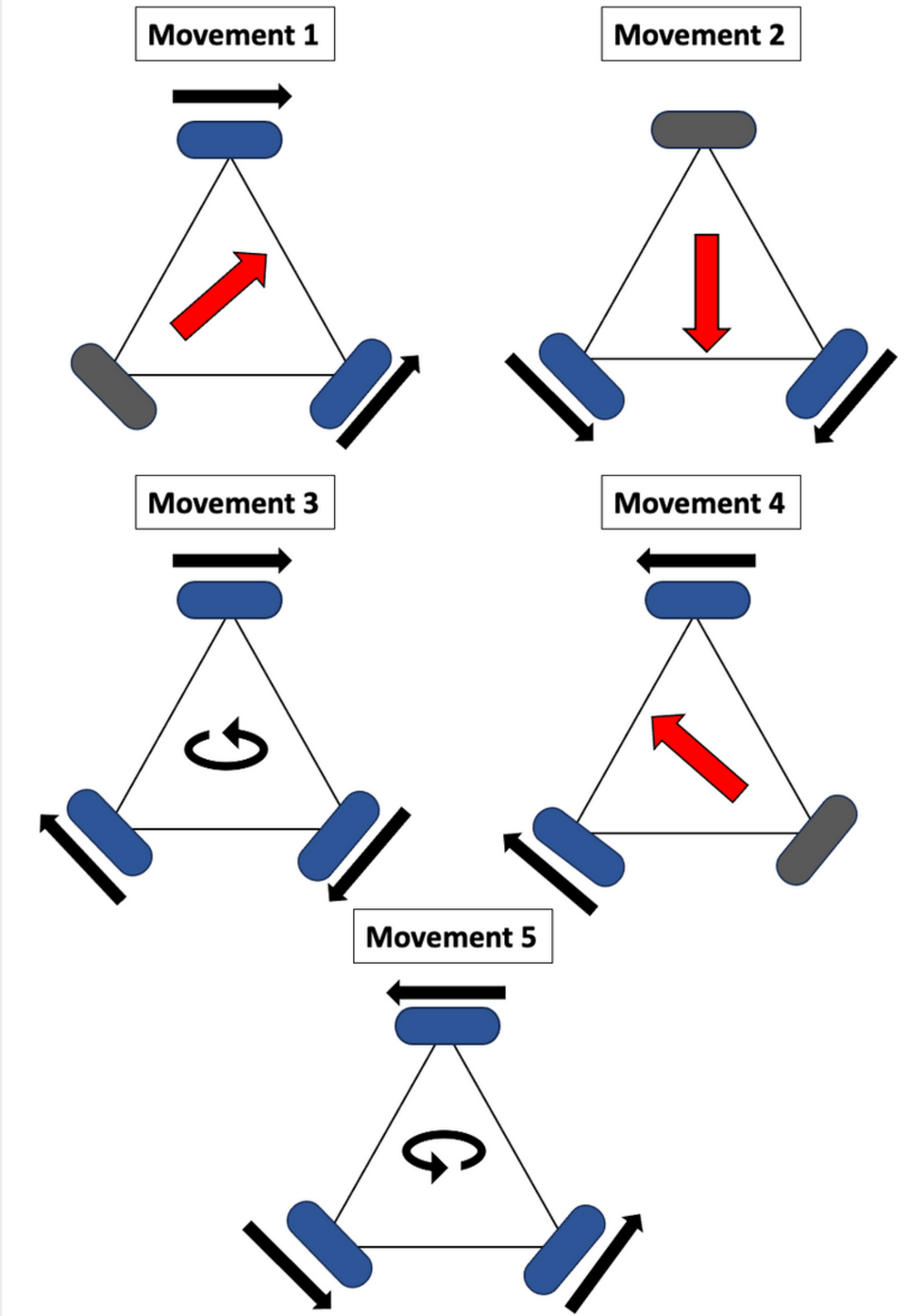
Circuit Diagram



Equipment Needed:

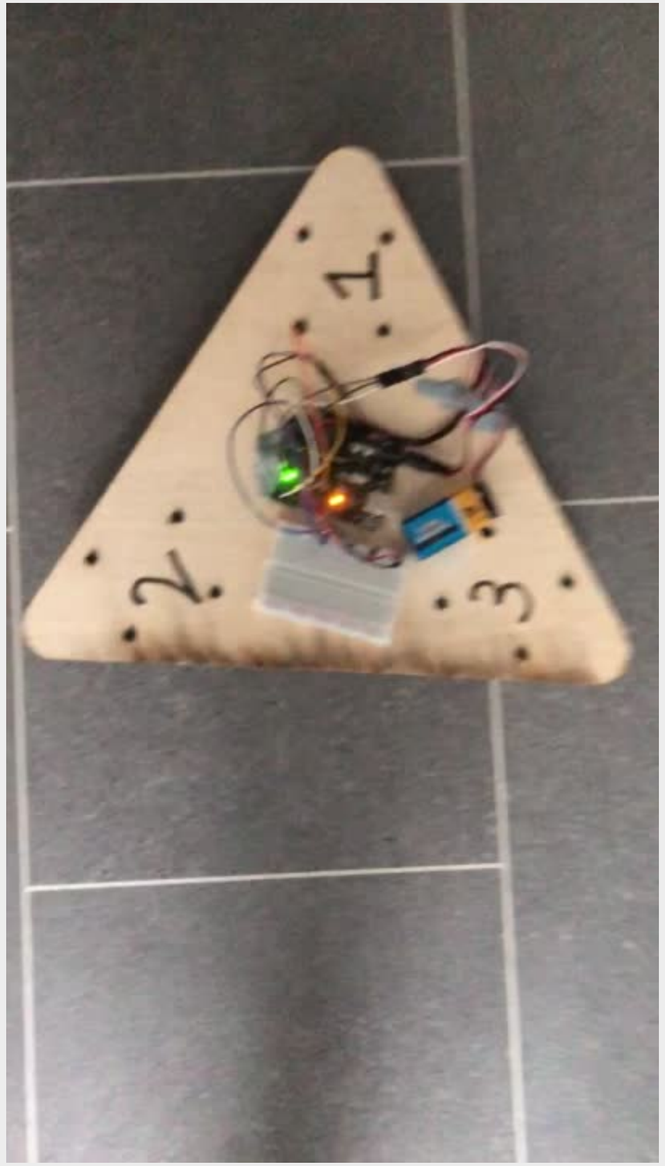
- Ardunio uno
- Ardunio Breadboard
- 9V battery
- 3 omni-wheels attached to a triangle cardboard cut-out

Diagram of Movements

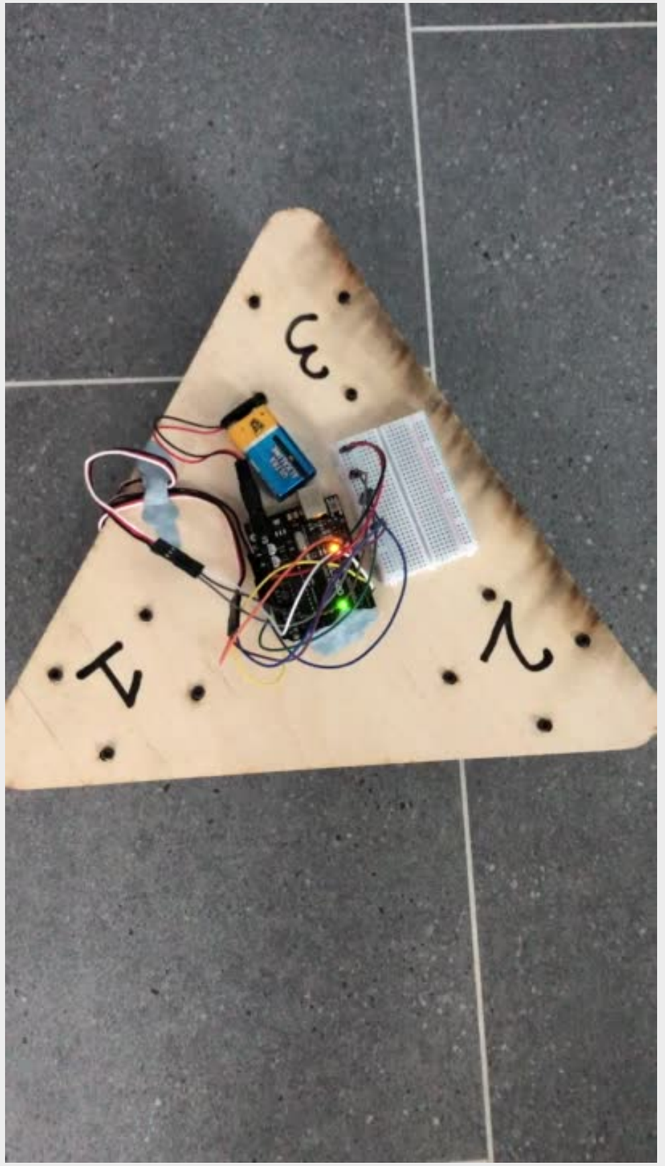


Video of Movements

Movement 1



Movement 2



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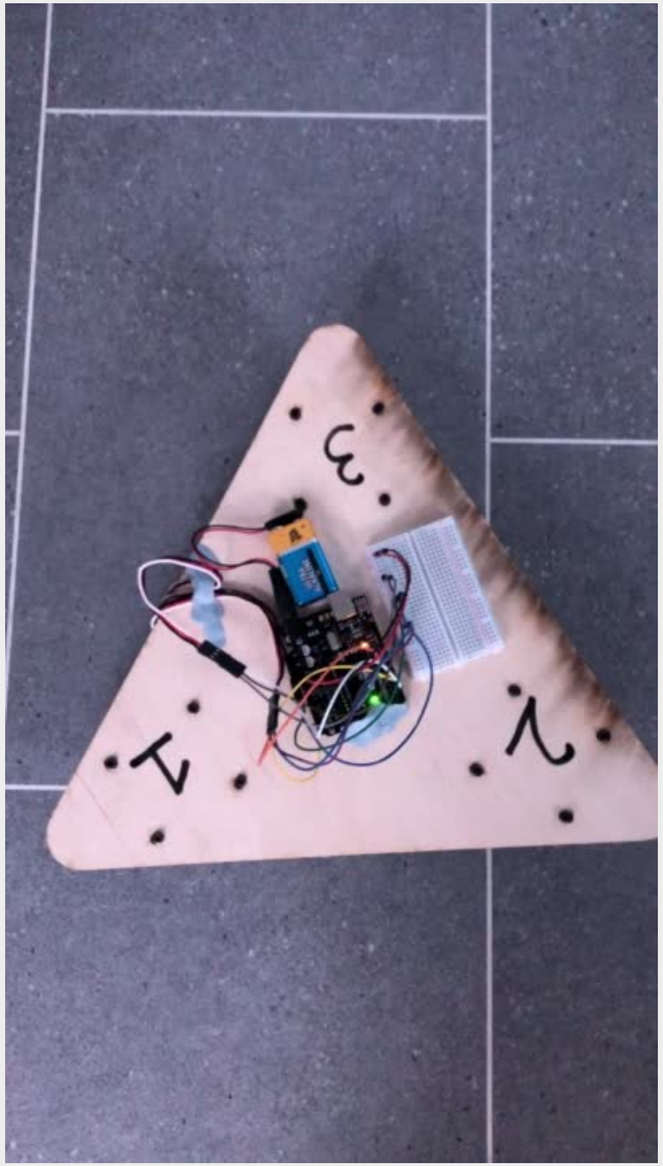
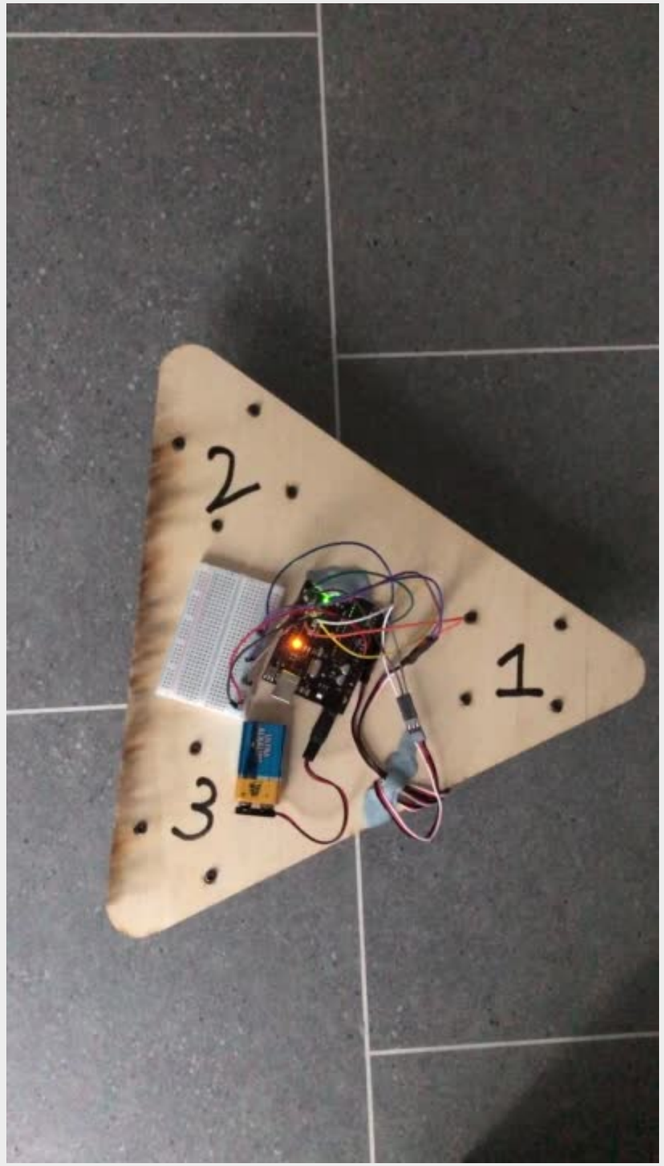
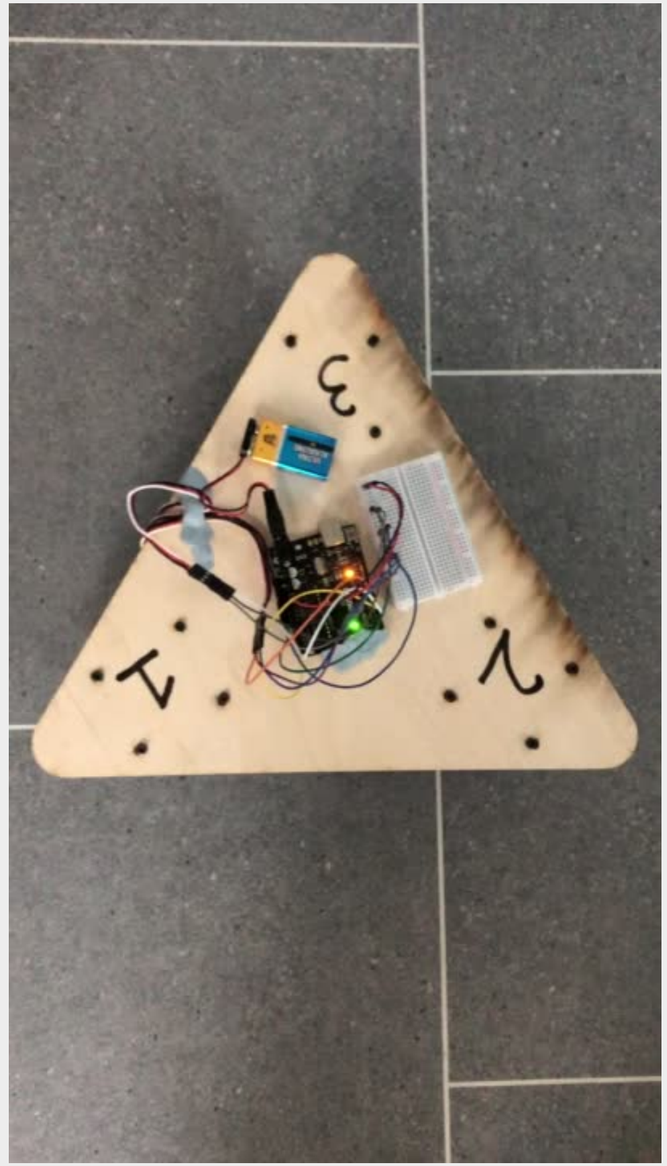
Movement 3



Movement 4



Movement 5



Code of the project

https://github.com/mkwawama/3-Wheel-Omnidirectional-Arduino-Board

Your Turn!