# The Wrangler - Design II

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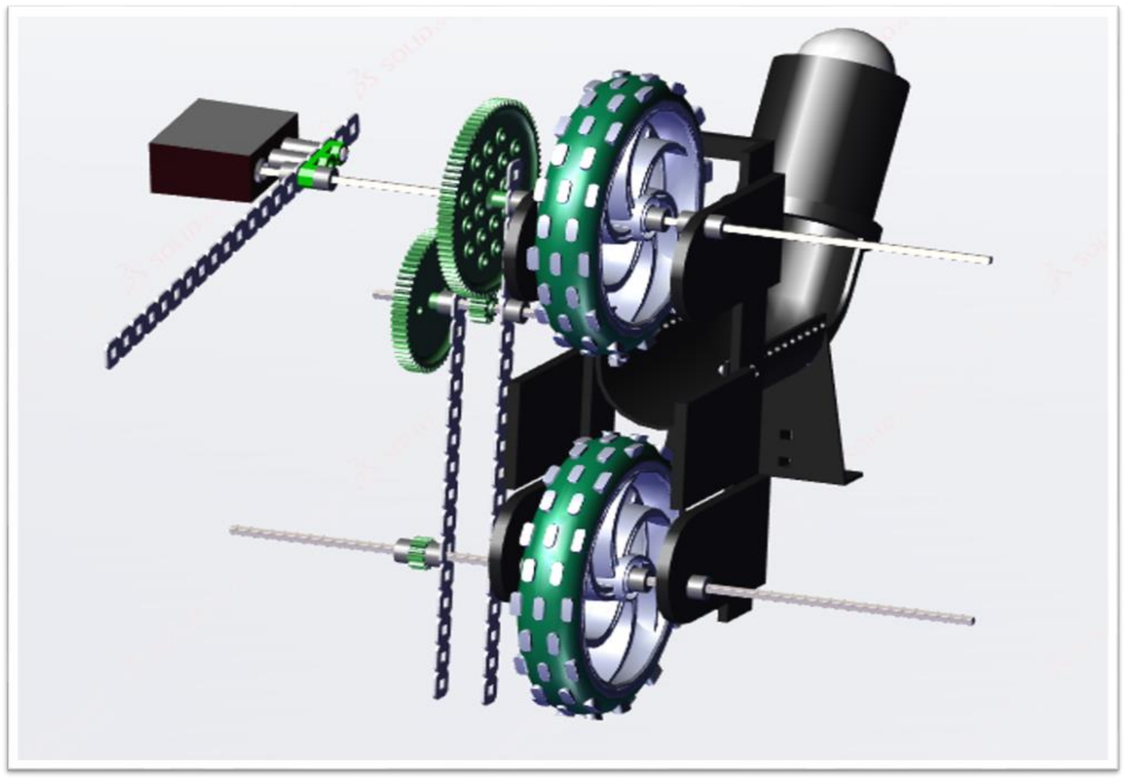
## Launching Mechanism

**Key ideas:**

- Upon battery initiation, the shooting mechanism uses torque to lift the shooting base for ball projection.
- Gravity and friction are employed in the slide mechanism:
  - Rubber bands provide grip and maintain an optimal distance between the wheels for maximum shooting distance.
  - The vertical orientation enables gravity to launch the balls.
- An angled connection to the base allows for an adjustable range between shots, through a screw attachment.
- A simple gear ratio is used, with the bottom wheel providing the most power to shoot.



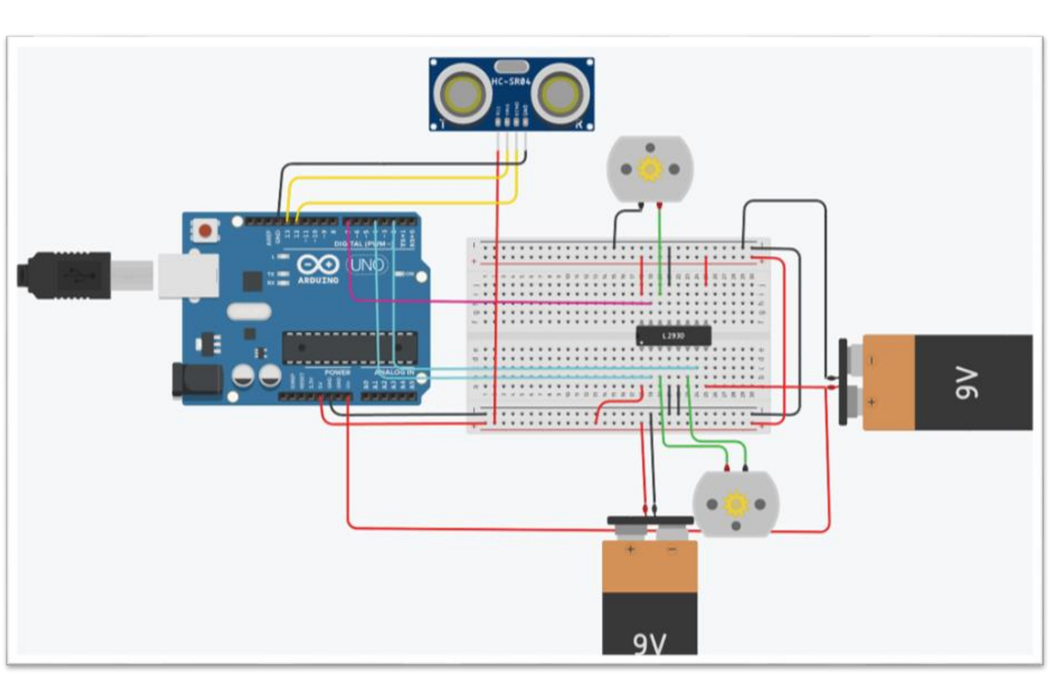
## Circuit set-up

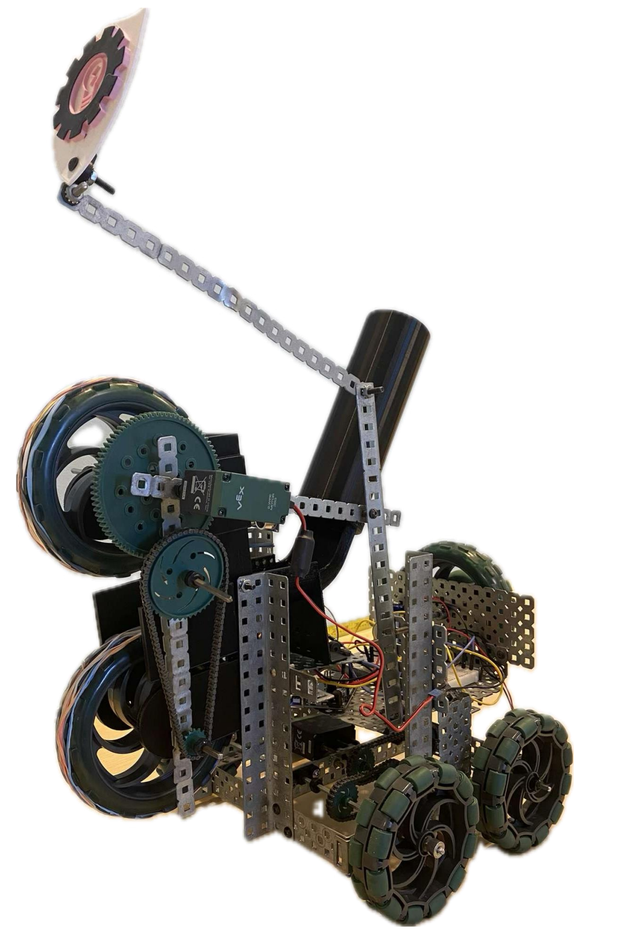
Setup:

- Installed two DC motors: one for shooting, and one for driving (with bidirectional movement).
- Incorporated an ultrasonic distance sensor to spot the opposing robot.
- Powered the system with two batteries.
- Controlled it all with an Arduino microcontroller.

Implementation:

- Wired each DC motor correctly.
- Tested the ultrasonic sensor for accurate distance.
- Organized the circuit neatly for reliability and easy maintenance.



## Code’s algorithm

1.Wait for 5 seconds.
2.Move forward and shoot the first ball.
3.Calculate the distance using the ultrasonic sensor.
4.If a distance equals 0, move forward and shoot the second ball.
5.If a distance of 7 feet or more is detected, move forward and shoot the third ball.
6.If the distance is less than 7 feet, move back and shoot again.

## Base design

- The build of the design has two levels in which the circuitry will rest.
- The entire launcher can be adjusted within the base
- There is a shaft placed on the back of the design to hold any weight needed to keep the robot upstanding.
- All wheels placed on the design can go forward or sideways
- The entire design of the robot allows for efficient yet versatile operation