The Ultrasonic Turret

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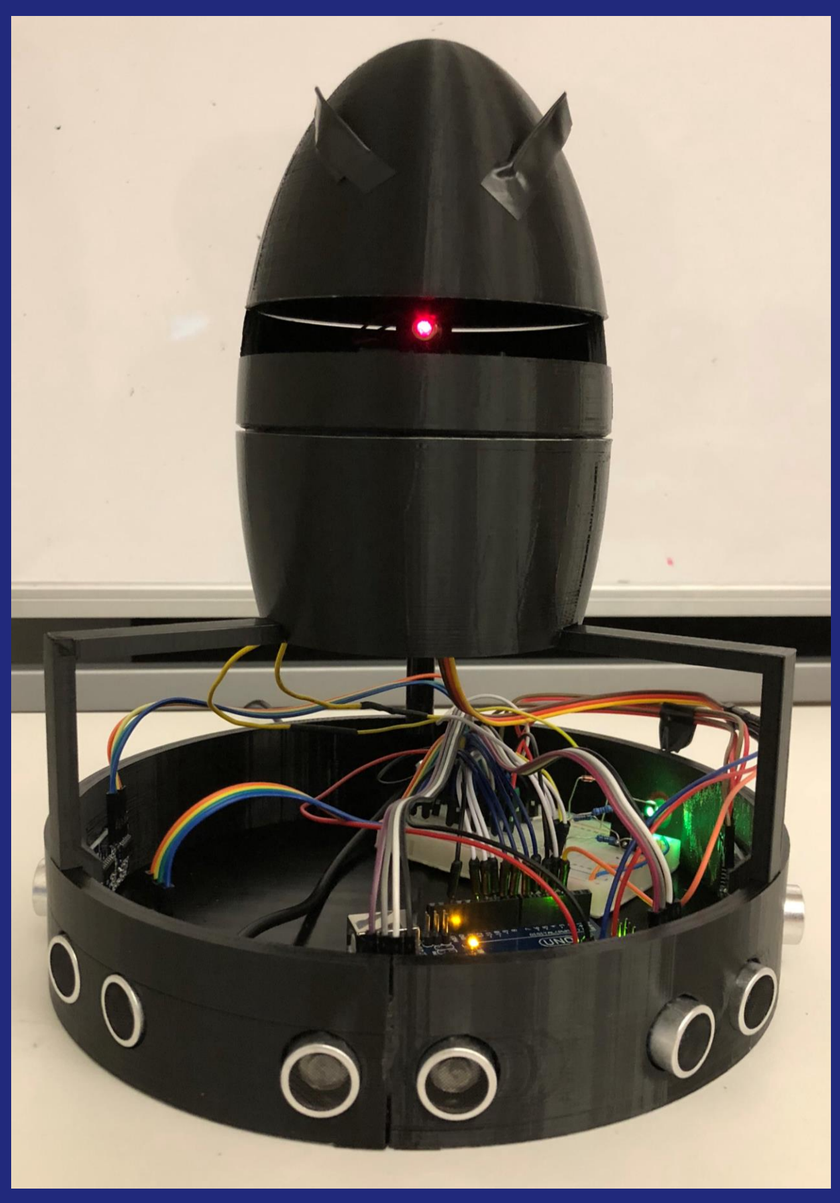
Abstract

The turret uses ultrasonic sensors to track an object and its motion when in the turret's field of view. Five sensors placed 45 degrees from each other (covering a total of 180 degrees) detect the proximity of each object in its field of view. The software then determines the closest object and points the servo toward it.

Materials / Hardware

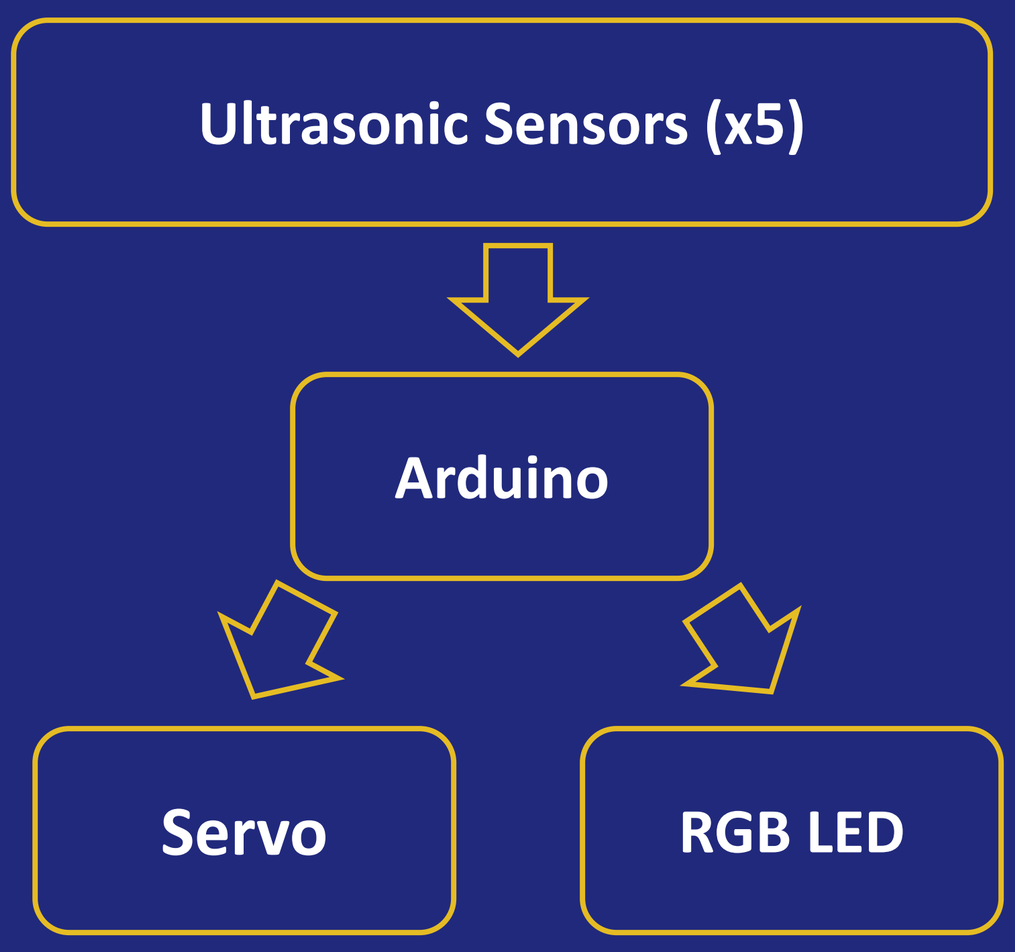
- 5 HC-SR04 Ultrasonic Sensors
- 1 TowerPro SG-5010 Servo Motor
- 1 Arduino UNO Microcontroller
- 1 Mini Breadboard
- 1 RGB Light
- 1 Laser
- 1 6V 1A Power Supply
- 1 Spool of PLA Filament
- 3D Printer



How It Works

Ultrasonic sensors work by emitting sound waves at a certain frequency and timing how long they take to return.

The Arduino gets values from the five ultrasonic sensors, five times. The Arduino will ignore any outlier values and average the trials. Once this is complete, the Arduino will find the smallest ultrasonic sensor value and turn the laser to face that sensor.



Future Improvements

The addition of more sensors, a bigger breadboard and different servo would allow for a 360 degree field of view and allow the servo to do complete rotations.

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