TYREX

EN 2532
Robot Design and Competition
2019

Group 14

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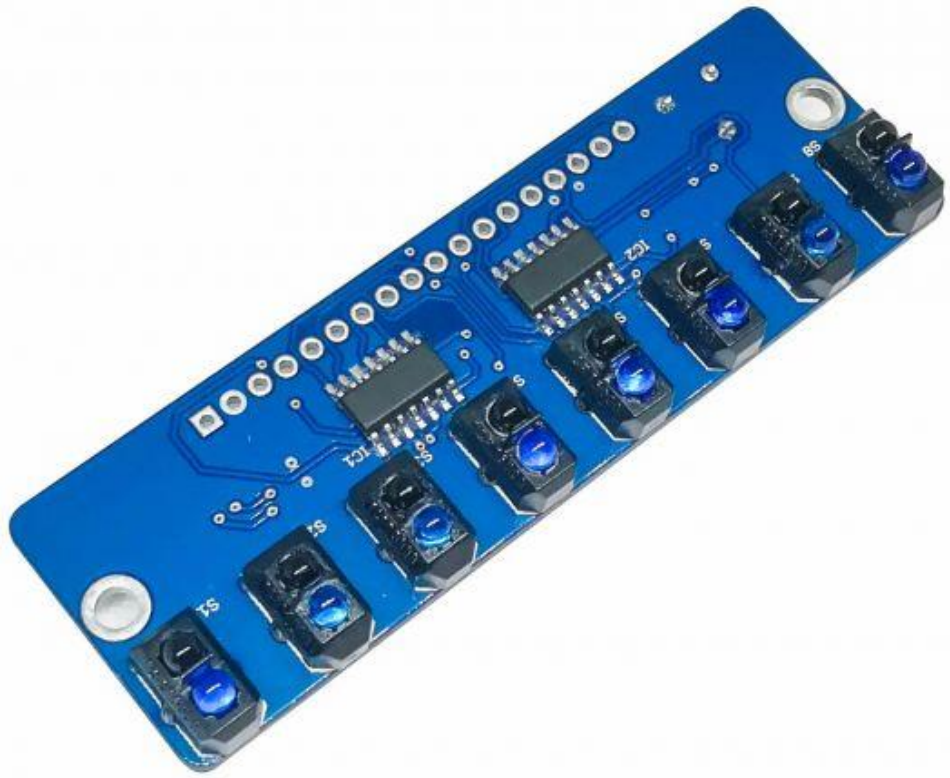
Parts Required

- Arduino Mega 2560
- Gear Motors-12V
- LiPo battery- 11.1V
- Motor Driver - LN293D
- Wheels and Cluster wheel
- Buck converter
- Chassis
- Boost converter

Line Following

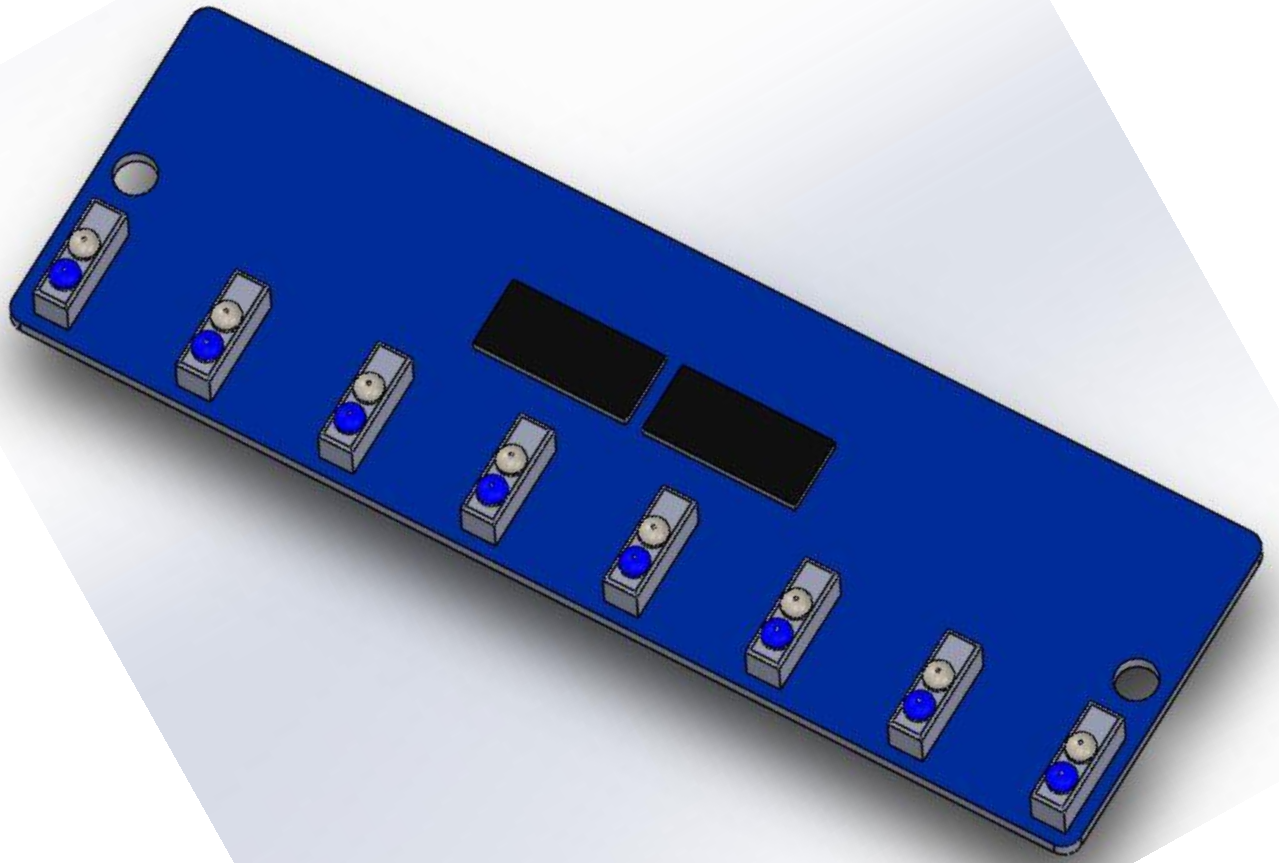
- Required parts
  - IR sensor panel - Reykha



❖Algorithm

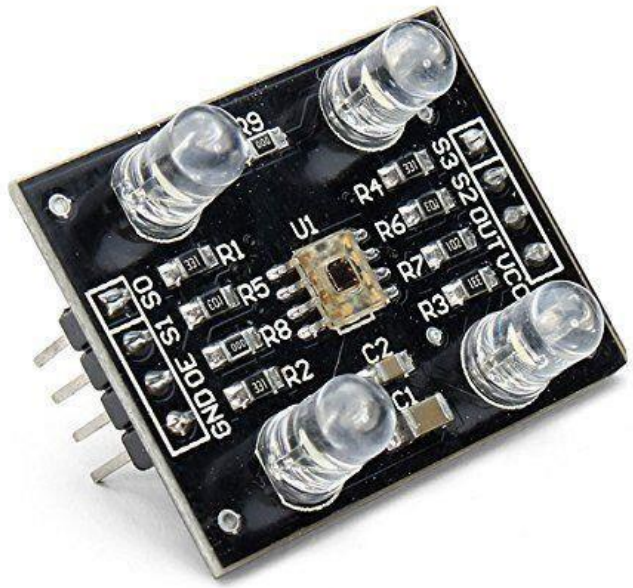
Depending on the sensor values from the IR sensor the microcontroller identifies how much the robot's central axis is away from the white line.

And then, the Arduino will give suitable pwm values to the motor driver to control the wheels connected to motors and make it follow the white line constantly.



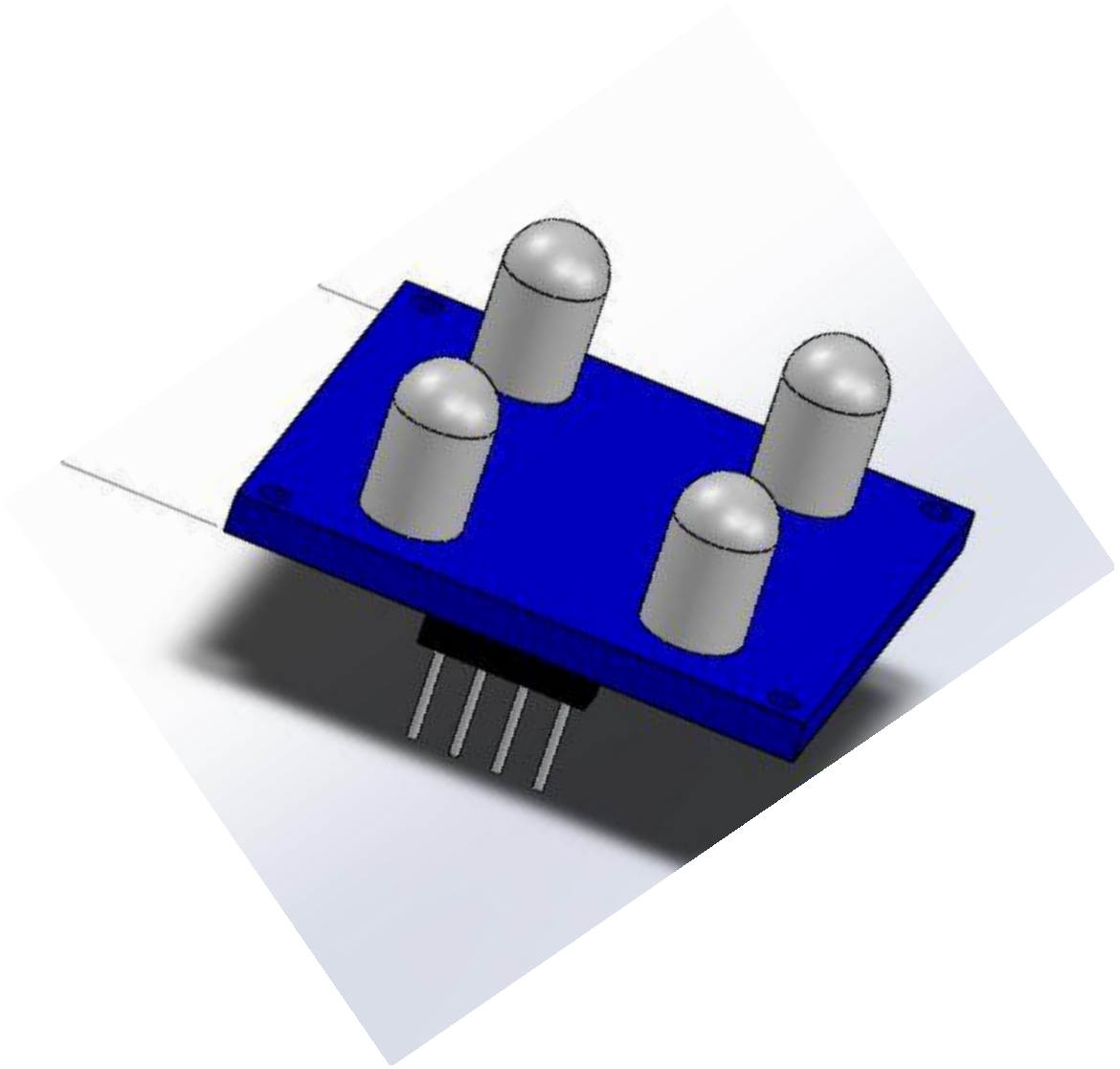
Coin Collecting and Unloading

- Required Parts
  - Permanent magnet
  - Colour sensor – TCS230
  - Servo motor



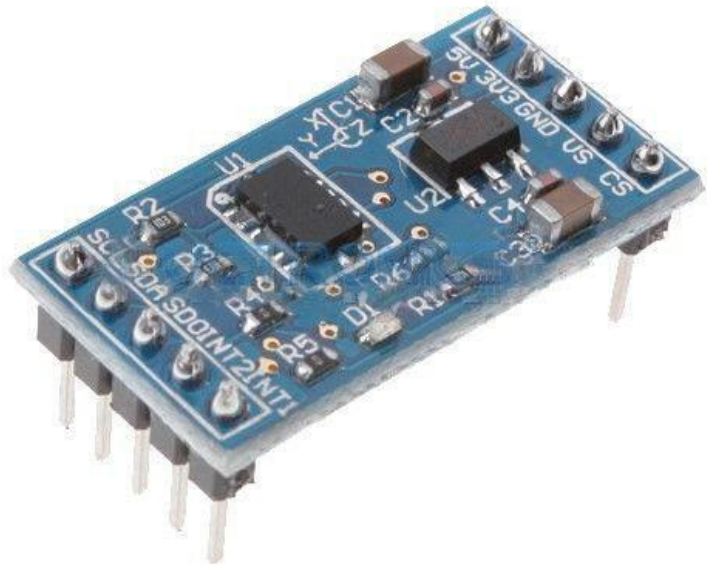
❖Algorithm

Using a servo mechanism we collect the coin and keep it attached to the magnet. Then we point it towards the colour sensor. Depending on the values of the sensor we figure out what is the colour is. After moving in the appropriate path, once the drop place comes we make the magnet away from the surface thus coin falling into the proper place.



Ramp Climbing

- Required parts
  - Accelerometer



- Algorithm

When the sensor indicates that we are on an aligned path we make the PWM values higher for the gear motors.

Then when climbing down we make the PWM values of the gear motors lower.

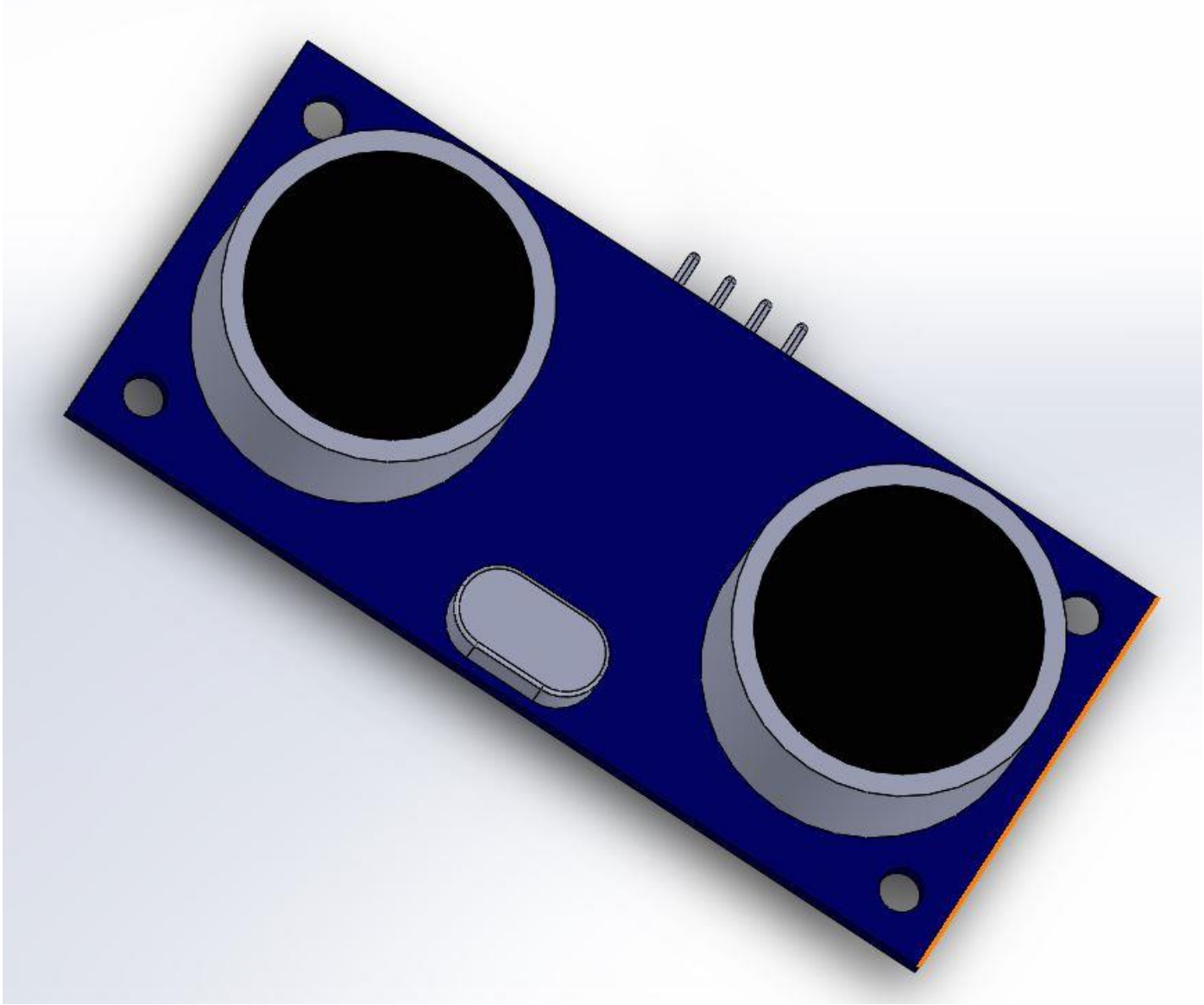
Wall Following and Maze Solving

- Required Parts
  - Ultrasonic sensor

❖Algorithm

The robot will follow a specific wall with the set of sensor values by the ultrasonic sensor. In a junction the priority is given as below.

- Go straight
- Turn right
- Turn left

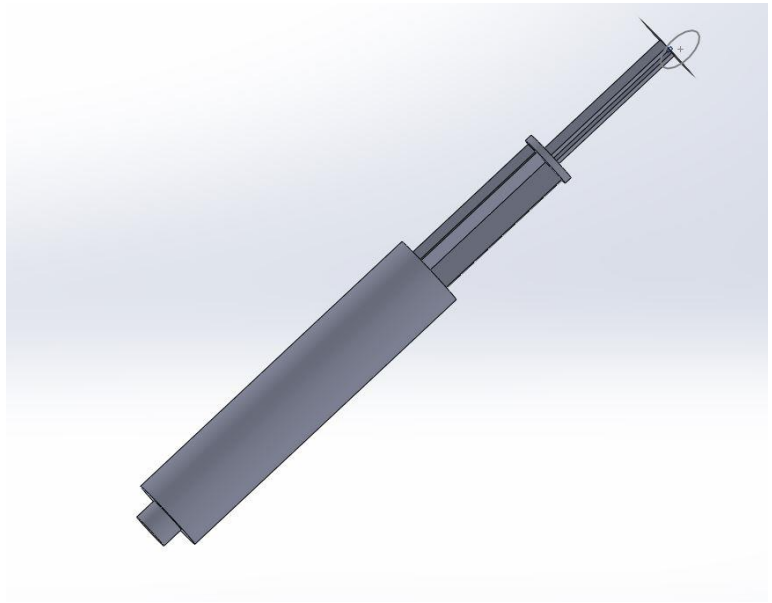


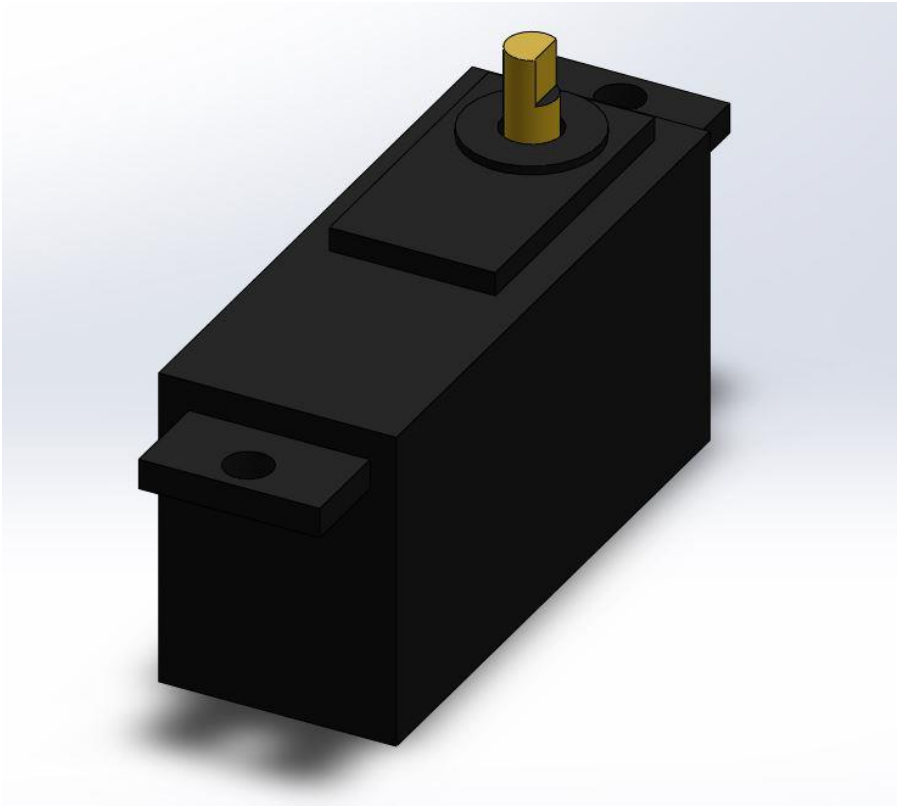
Water Transferring

- Required Parts
  - Servo motor
  - Syringe

❖Algorithm

After identifying the two water barrels, using the syringe we suck the water from one tank and push the syringe using a motor to drop the water into other tank in order to open the gate.





Complete Solidwork Design