# COMP470: Mobile Robotics

Spring 2019

Lab 4: Seek The Light

The purpose of this lab is to add source seeking behavior to your robots. We will utilized a simple directional light intensity sensor. This sensor should be mounted on the right-rear of the robot, and face a direction that isn't aligned with the xy axis of the robot. You will need to utilize you knowledge of coordinate transformations to transform the measurements from the sensor into the coordinate frame of the robot.

Connect the Sensor

1. Obtain one of the 3D Printed sensor brackets, screw, and cable from the instructor.
2. Attach the sensor to the screw hole just in front of the left rear tire.
3. Connect the cable to the sensor and to the circuit board on the robot. Use connector J15 (circled in red).
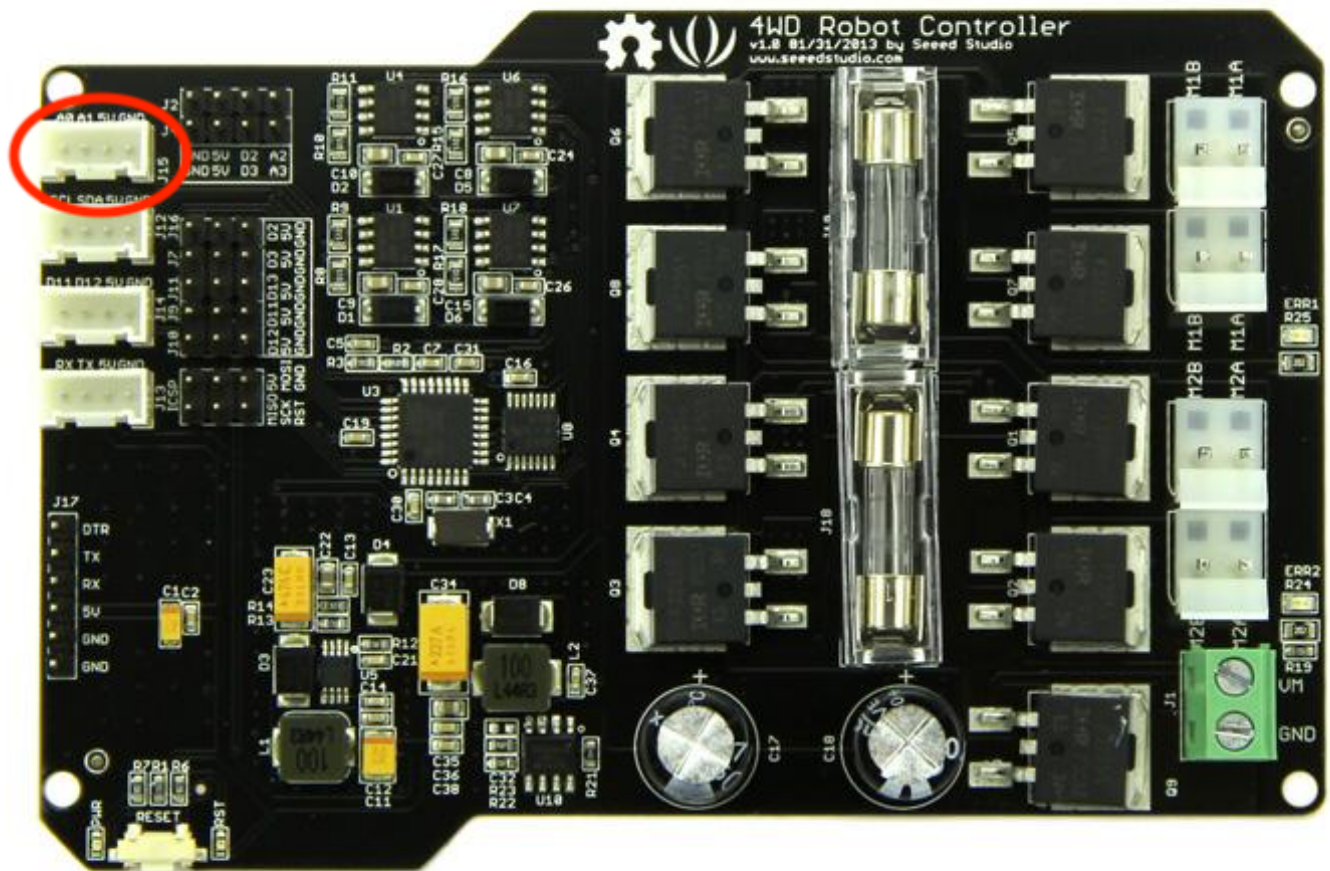
Basic Measurements

1. Create a sketch with this code to read from the light intensity sensor.
2. Verify with the Serial Monitor that the sensor is working properly.

```
int analogPin = A0;
int val = 0;

void setup() {
  Serial.begin(9600);
}

void loop() {
  val = 1024-analogRead(analogPin);  // Input range is 0-1023. Subtracting 1024 inver
ts signal.
  Serial.println(val);
  delay(100);
}
```

Seek The Light Race

Now that we have a properly working light intensity sensor we can get to the good stuff. In this phase we will combine the code you developed in previous labs to enable your robot to drive toward a light source while avoiding walls.

I recommend starting with no obstacles and get down the process of driving to the light before adding in the obstacle avoidance algorithm.

References

[ACC2014](ACC2014)

[ACC2013](ACC2013)

HeckerSwarms

Lab Grade

1. We will have a timed race to find the light source in the presence of obstacles. We will take the minimum time out of three trials.
2. Turn in a zip file containing all source code and a written lab report documenting your algorithm and your transormation matrix.