# ECGR4161/5196, MEGR4127 – Introduction to Robotics
# Lab Assignment #7 – Version 2.0

See Canvas for the due date/time

In this lab assignment will be done in pairs or individually. The main objective is to program your TI RSLK Robot to identify the closest location of an object and drive towards it. To identify the object, you will need to turn a servo motor with an ultrasonic sensor mounted to it.

**Submission type:** Live demonstration and lab report (Must include your name and all requirements mentioned below)

**Lab specifics**

For the hardware, you should mount a servo motor somewhere on your vehicle. On the arm of the servo (attached to the shaft of the motor) you should mount your ultrasonic sensor. Wire your servo motor and ultrasonic sensor correctly.

The following guidelines must be followed for the live demonstration to a TA:

1. Demonstrate the downloading of code to your robot
2. Set the robot down at a location and pose identified by the TA (could be in EPIC 2130, could be in the hallway). The pose of the robot (way it is pointing) will be such that the closest wall is 120 cm away. The TA will place 3 obstacles around the robot.
3. With a press of a button, the robot stays in place but turns the servo motor shaft 180 degrees. You should measure distances using the ultrasonic sensor and identify the location of the closest object.
4. The robot should then turn 180 degrees in place and repeat the 180 degree servo sweep and ultrasonic sensor measurement.
5. The robot should then turn in place to point towards the closest object, then drive towards the object and stop when it touches the object.
6. A bump sensor or the ultrasonic sensor can be used to determine how far you stop from the object. Your robot should NOT crash into the object. This should be a controlled movement torwards the object.
7. The TA will record how close you end up to the object, and if you selected the closest object.
8. LAB 07 Example -------> https://youtu.be/tBUe3CQFo6I

**Lab Report - Submission Instructions:**

1. Prepare a file, output to PDF that includes:
    a. Your name and your "partner's" name (if applicable)
    b. What the general objective the robot / apparatus is expected to perform, and
    c. Commentary on the lab (lessons learned, problems encountered).
    d. Attach your code to the end of the report, as detailed by TA Joey Phillips (video, document guidelines posted on the discussion area of Canvas). We want to see structure, indentation, and comments. Lots of comments.
2. Upload the PDF to Canvas, Lab 7 submission, one per lab group