SYSEN 5411 Fall 2025

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**Lab 5 Report – Sensors**

**Video A:** TST to target *without* obstacle - <https://youtu.be/AYudup7gJ3s>

**Video B:** TST to target *with* obstacle - <https://youtu.be/O2paG8kKYVM>

**Video C:** 360° scan - <https://youtu.be/NLivk_MdXv8>

**TST Obstacle log:** see attached TXT

**Image:** see attached PNG

**File:** see attached CSV

**Reflection:**

The plot did not do a great job of showing the features around it. I placed objects at varying distances at 90 degrees, 180 degrees, and 270 degrees, but the only way to find them on the plot would be to know they were there. Every 15 degrees, I stopped the robot to collect 5 samples and average them to remove some error, but this did not seem to have enough effect. In the gaps between objects, the readouts were quite erratic, suggesting the sensor does not do a great job at saying there is “nothing” there. I tried to combat this by nulling out readings greater than 60,000 centimeters, but there were numerous data points that seemed to be randomly located on the plot.

If I were to repeat this experiment again, I would increase the granularity of sampling to either every 5 degrees or every 10 degrees (although there is a chance that new error will be introduced because the XRP motor controllers do not do well at handling small movements). I might also find more objects to place around the robot so that more of the 360 degree circle is covered. Doing so would decrease the chance of readout error from the ultrasonic sensor trying to place an object that doesn’t exist.