

1001 Post-Lab
Group 14

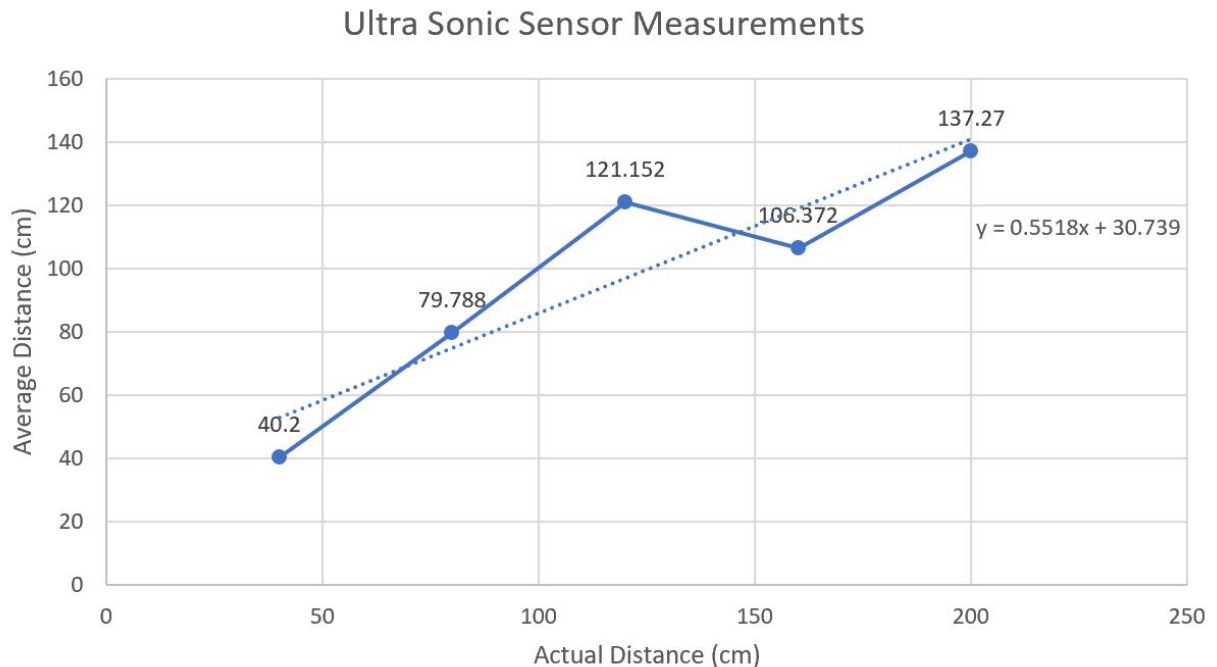
1.

Lap	Error (cm)
1	8.0
2	17.5
3	24.0
4	35.5

The error increased after each lap because the angle was increasingly inaccurate from the errors of the previous laps.

This tells us that dead reckoning is not accurate nor is it precise, especially since it is a two wheel drive.

2. The length of the square's sides never changed, however the angle changed after every subsequent turn. One source of error that caused this would be the wheels sliding on the whiteboard and losing traction.
- No, the star pattern had the same issue wherein the angle was increasingly inaccurate. This tells us that dead reckoning should not be used for navigation, and other sensors such as vision sensors and line trackers would be more viable options.



3. The offset of the linear best fit is approximately 30 cm. The slope of the linear best fit is .55, while the ideal slope would be 1, which would mean that there is no difference between the actual distance and the average of the measured distance.
4. Some sources of error that arise from using encoders are inaccurate measurements. Sources of error that arise from using an ultrasonic sensor are sensor noise and interference from other sensors, which cause inaccurate measurements for larger distances.
- 5.

	Passive	Active
Proprioceptive	Encoders	
Exteroceptive	Limit Switch	Ultrasonic, Reflectance

6. Ultrasonic Sensor: If the maze had walls, the ultrasonic could be used to determine the robot's distance from these calls, and navigate to avoid these

Reflectance Sensor: We could use the reflectance sensor as a line tracker and follow black tape that outlines the path through the maze.

Limit Switch: Again, if there were walls, the limit switch would hit the wall, and tell the robot to back up and turn into a new path.