

	Intro To Robotics LAB #6 Report	03/28/2024
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Lab Objective:

The objective of this lab is to understand how to localize a robot using bump sensors and encoders to travel to the center of a rectangular arena and stop. The robot must do so only using three movement functions: driveStraight, rotateInPlace, and reverse.

Lab Figures/Tables (Testing Data)

Table 1: Turn Adjustment for Front Two Bumpers

Adjustment Angle	Observed action
25 degrees	Turned too much and never was perpendicular
10 degrees	Somewhat improved reaction but still over corrected
5 degrees	Was the perfect degree used to correct the robot

When testing the robot, we had it angle itself based on what bump sensor was hit. To optimize how much the robot turned different angles were used to make sure the robot turned just enough to hit the wall head on. To get an idea on what values to begin with to rotate, we referred to TI-RSLK MAX's bump switch assembly datasheet which had the different degrees each switch was placed around.

Commentary and Conclusion:

Our initial approach was to adjust how much the robot turned based on what bump switch hit the wall. We found that an angle of 5 degrees was the perfect amount to turn the robot. Next, we developed an algorithm that would get the encoder counts it took for the robot to travel the distance of one side of the wall and divide that number by two. Next the robot would travel until it was perpendicular to the other side of the wall and turn 90 degrees. It would then travel until it hit the other wall and divide this encoder count by two. Then it would travel the acquired encoder count distances. The only trouble we had with this lab was finding the correct degree amount to get itself perpendicular to the wall.