

Lab 6 Ideas

Step 1. Characterize your sensors

Bump sensors

Write **BumpAvoid**

Write **BumpNuzzle**

Sonar

Characterize sensor:

How far/near can you see objects?

What is a good threshold to determine if you can see a wall?

Step 2. Measure Walls

2a: Drive robot parallel to the wall. Collect sonar data. Use a threshold to determine the extent of the wall

Analyze data off-line

2b. Drive robot at an angle to the wall. Collect sonar data. Use a threshold to determine the extent of the wall, and line fitting to determine the angle

Analyze data off-line

2c. Use BumpNuzzle behavior to align robot to a wall, then write a behavior to find the extent of the wall.

The segment part of the **PolyTour** FSM.

Step 3: Follow Wall Segments

Follow with bang-bang control

Follow with one sonar ranger

Using sonar range with one sensor. (This is what I've implemented. It would but could use more info)

Follow with two sonar rangers

using sonar range and angle

Step 4: Putting it all together

Use one of:

1. **WallFollow** to tour object –
2. **PolyTour** FSM to tour object
3. remote control to drive around the object

Finding corners

WallFollow: When robot turns more than 45°, mark a corner. Measure distance between corners. Maybe use odometry to decide when you have returned to the origin.

PolyTour:

Remote Control: manually

Determining shape

WallFollow: Use corner marks to distinguish segments. Fit line through contact cloud for each segment. Find intersections?

PolyTour: PolyTour reports walls in segments. Use arc info to note the intersegment angle, or use the same point cloud analysis as above.

Remote Control: Use manual segment boundaries, and repeat same analysis as above.