Robots HW1

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Changing Reference Frames

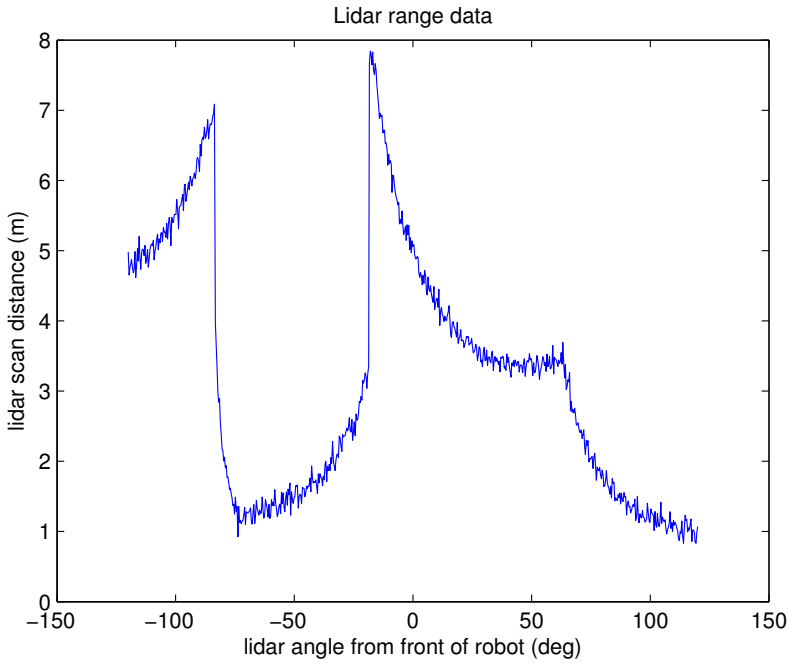

Figure 1: Lidar Range Data

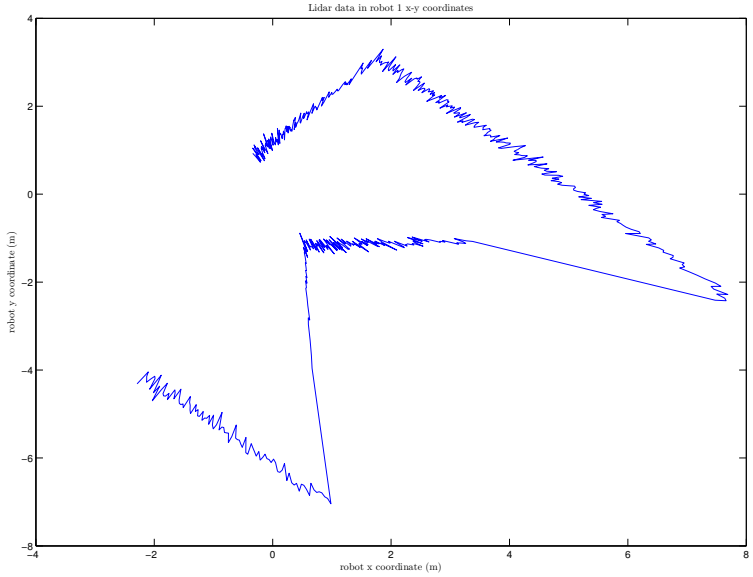

Figure 2: Lidar Data in Robot 1 Frame

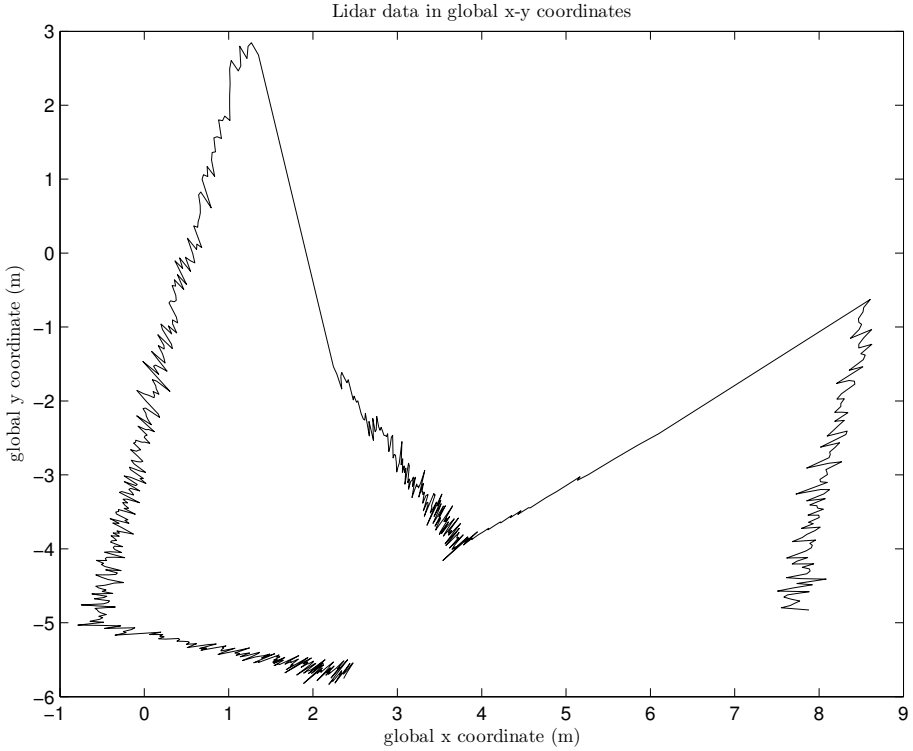

Figure 3: Lidar Data in Global Frame

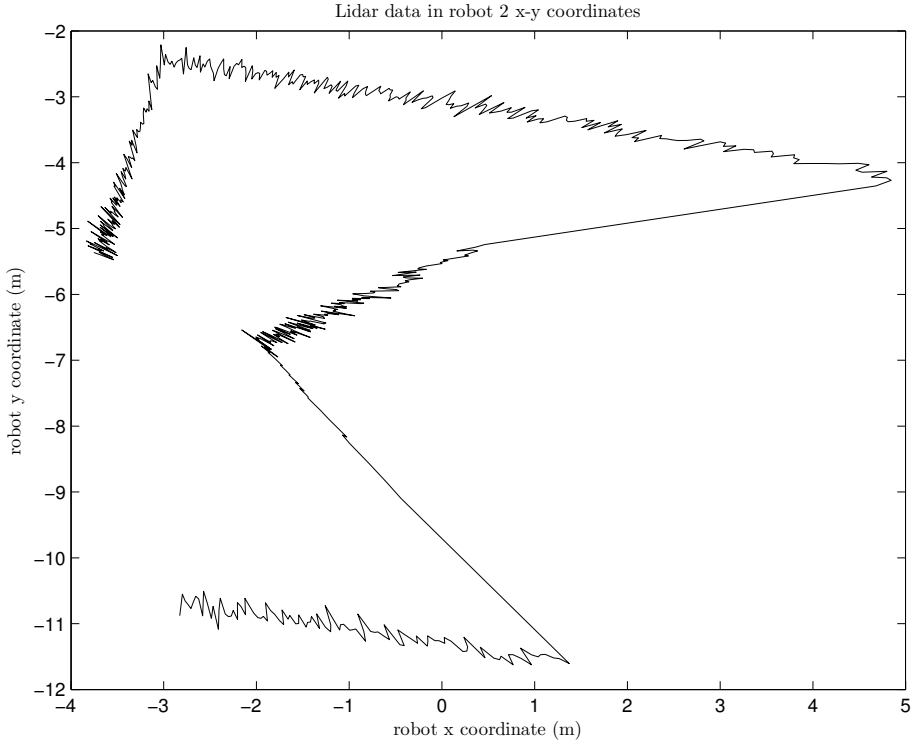

Figure 4: Lidar Data in Robot 2 Frame

Getting to Know the Simulator and Running a Simple Control Program

1. The command sets the linear and angular velocity of the robot. The inputs are:
   - The communication port of the robot
   - The desired forward velocity in $\frac{m}{s}$
   - The desired angular velocity in $\frac{rad}{s}$
2. limitCmds.m is in the file to be tested
3. See figure 5
4. My boring robot program is called 'Zoolander' because the robot always turns right 90 degrees when it encounters an obstacle. It cannot turn left. See figure 6

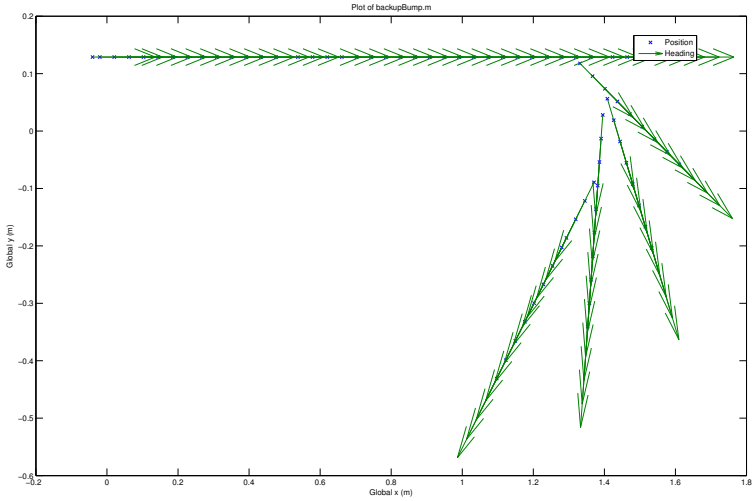

Figure 5: Data from simulating backupBump.m

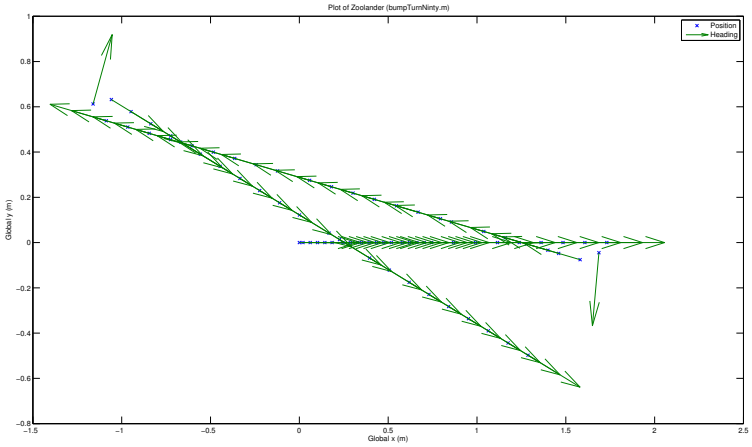

Figure 6: Data from simulating bumpTurnRightNinty.m

Feedback Linearization

1. feedbackLin.m is in the file to be tested
2. See figure 7
3. Did it!
4. See figure 8

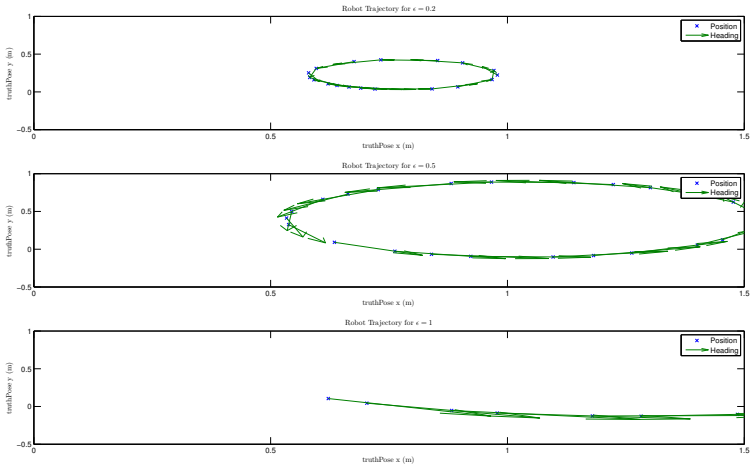

Figure 7: Data from running feedbackLin.m with differen ϵ

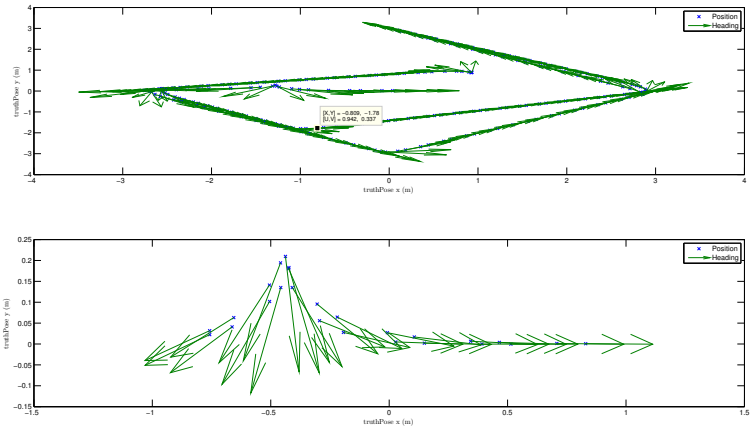

Figure 8: Data from visitWaypoints.m