

CMPUT 412: Experimental Mobile Robotics
Winter 2018
Demo #2

Date: Thursday January 25

Topics: Kobuki Turtlebot Teleoperation / Wanderbot State-Machine

Objectives

- Learn how to obtain range and imagery data from an Xtion Pro Live RGB-D camera
- Remote Teleop. a mobile robot (e.g. TurtleBot) & program a collision-free “wander” behaviour.

Procedure

Part I:

Connect your computer to the Xtion Pro (Live) RGB-D camera, obtain and display the image and depth map in Rviz. Note that the depth image contains the same information as is obtained with a laser range finder. You should convert the depth image from Xtion Pro and simulate a 2D lidar (laser range finder). Also, in Rviz, display this range data to ensure visually that your conversion is performed correctly. Both students in a group need to complete and demo this part, independently. **Demo to TA**

Part II:

Teleoperate your Turtlebot using both the keyboard and a logitech joystick **Demo to TA**

Use your ‘**wanderSM.py**’ from Demo #1, and move the real TurtleBot around randomly in a collision free manner. See if you can improve the “random-walk” behaviour, by imagining you are designing a carpet vacuuming behaviour for your robot. Note that you will need to use Xtion Pro that generates depth data to produce the 2D range data (as in Part I) that is expected by the wanderSM (see Chp.7 example 7-2 of the book again). Note also that the motion command in the existing code in Chapter 7 is “jerky”, and you should use the idea in ‘Velocity Ramps’ (Ch8) to improve motion continuity. Video record your robot moving randomly in a collision free manner. **Demo to TA**

Marking

If you are able to complete the demos before the end of the lecture, you will receive:

Part I: 30% (independent demonstration)

Part II: 70% (group demonstration)

If a student is not able to complete any parts of the demo within the lecture session, you will get a 20% penalty, and an additional 20% for each day of delayed demo.