

CENG 6838 Robotics

Homework Turtlebot Spring 2016

Due February 24, 2016

THOSE USING TURTLEBOT

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Put your name, Student ID, HW number, date, and the Course Number on your homework. Please submit a paper copy at the beginning of class. The assignment should be typed.

Review the New Turtlesim Guide on our WEB site.

http://sceweb.sce.uhcl.edu/harman/CENG4391/WEBdata/TurtlesimGuide2_13_2016.pdf

- I. Update the Table of Turtlesim Topics, Services, etc. for Indigo version of ROS (30).

From the Turtlesim description fill out the following Table:

Command	Nodes/Services	Publication	Subscribe/topics/parameters
<code>\$roscore</code>	Master /rosout		
<code>\$roslaunch turtlesim Turtlesim_node</code>	- - - -	/turtle1/color_sensor - -	
<code>roslaunch turtlesim turtle_teleop_key</code>			
<code>roslaunch turtlesim -list - - -</code>	<code>rosservice commands -call - - -</code>	<code>rostopic -show - - -</code>	

Review the Rules for essays.

- II. We start TurtleBot – Read or the following and write a short essay about the TurtleBot – its specifications and capabilities. Visit the ROS website: (30 points)

<http://wiki.ros.org/Robots/TurtleBot>

In the tutorial read the following sections- 5.1, 5.2, 5.3. Applications

Looking Around

1. [A First Interaction](#)
Run your first interaction with the turtlebot - chatter!
2. [Visualisation](#)
Find and call launchers to visualise the turtle and its data streams.
3. [3D Visualisation](#)
Visualising 3d and camera data from the kinect/asus.

Teleoperation

1. [Keyboard Teleop](#)
Keyboard teleoperation of a turtlebot.
2. [Joystick Teleop](#)
Joystick teleoperation of a turtlebot.
3. [Qt Teleop](#)
Qt teleoperation of a turtlebot.
4. [Interactive Markers Teleop](#)
A tutorial describing how to use rviz interactive markers for controlling the TurtleBot.

Navigation

1. [SLAM Map Building with TurtleBot](#)
How to generate a map using gmapping
2. [Autonomous Navigation of a Known Map with TurtleBot](#)
This tutorial describes how to use the TurtleBot with a previously known map.

III. Visit the website:

<http://learn.turtlebot.com/>

Study 12, 13, 14, watch the videos and write a brief summary of the mapping and avoidance.

(20 Points)