CENG 4391 Robotics

Homework 4 Spring 2016
Due February 23, 2016

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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
$roscore	Master /rosout		
$rosrun turtlesim turtlesim_node	- - - - -	/turtle1/color_sensor - -	
rosrun turtlesim turtle_teleop_key			
rosnode commands -list - - -	Rosservice commands -call - - -	rosmsg commands -show - - - -	

You can go to the lab D158 and do this if you wish.

Review the Rules for essays.

II. Write up your experience in the lab. What did you do and what did you learn. (20 points)

(Those who cut class and missed the lab need to pick up the handouts and go to D158 and go through the exercises for next week)

III. We start TurtleBot next week – 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.

IV. 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)