**PS7**

**Using the ROS Navigation Stack**

***Out: Thursday, November 3***

***Due: Thursday, November 12***

**Required Reading**

* <http://wiki.ros.org/navigation>
* http://wiki.ros.org/amcl
* <http://wiki.ros.org/move_base>
* <http://wiki.ros.org/base_local_planner>
* <http://wiki.ros.org/rviz/DisplayTypes>
* <http://wiki.ros.org/gmapping>

**Introduction**

In this assignment you will be configuring existing ROS packages to generate a map using SLAM, and then various path-planning algorithms to navigate the map. You will also be using RViz to dynamically visualize your robot’s performance.

**Setup**

cd ~/catkin\_ws/src

git clone github-uml-install-url

cd ~/catkin\_ws/src

git clone github-uml\_nav-url

*When you are using nodes in the install directory, source install/setup.bash instead of devel/setup.bash.*

**Using the gmapping SLAM Package**

roscore

rosrun uml\_nav init\_slam\_world.launch

**Navigating an Existing Map**

roscore

rosrun map\_server map\_server map.yaml

roslaunch uml\_nav init\_nav\_world.launch

roslaunch uml\_nav move\_base.launch

roslaunch uml\_nav amcl.launch

./send\_goal.bash number

**What You Need To Do**

You must do this for two different robots. We suggest using the Pioneer 3DX and Turtlebot.

**SLAM**

Use the gmapping package to generate a map using SLAM.

**Navigating an Existing Map**

* Modify the five YAML configuration files in uml\_nav/share/nav\_config for each of the following robots.
* Set ***at least*** two different recovery behaviors
* Configure RViz to display relevant data

**Submission**

Zip your uml\_nav directory. It should contain at minimum the following files:

* base\_local\_planner\_params.yaml
* costmap\_comon\_params.yaml
* global\_costmap\_params.yaml
* global\_planner\_params.yaml
* local\_costmap\_params.yaml
* A .rviz RViz configuration file
* Your two maps generated using SLAM