ROS Crash Course

Class 3

ROS

UNLV | Howard R. Hughes College of Engineering

DASL

Drones and Autonomous Systems Lab @ UNLV

Agenda

-Old HW

-ROS Concepts

-How to Make/Build ROS Packages

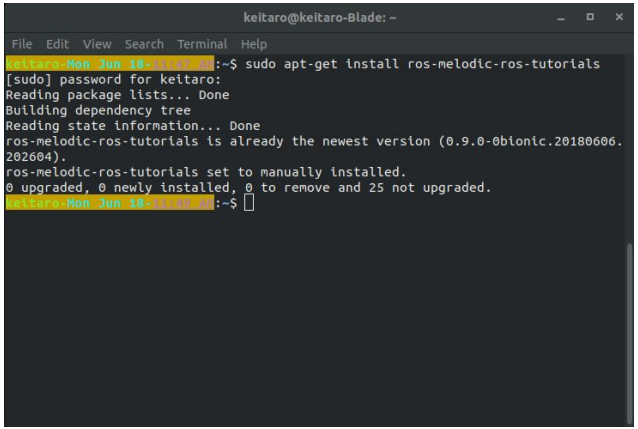
-New HW

HW

-Please start this download while everyone is showing their HW

-$ sudo apt-get install ros-melodic-ros-tutorials ros-melodic-rqt ros-melodic-rqt-common-plugins

-Don’t worry if you see 0 newly installed that just means you already have it



ROS Concepts

-Master

-Node

-Publisher

-Subscriber

-Topic

-Message

ROS Concepts

-rosservice: a way to send a request and receive a response

-rosparameters: a way to edit the ROS Parameter Server

-ros commands:

    -ros[command] convention is used for each shell command

    -roscore: starts the rosmaster, rosout, and ros parameter server

    -rosrun: runs a ros node

    -rostopic: ros command tool used for rostopics

ROS Concepts

-Open a shell and run $ roscore

-In a new shell run $ rosrun turtlesim turtlesim_node

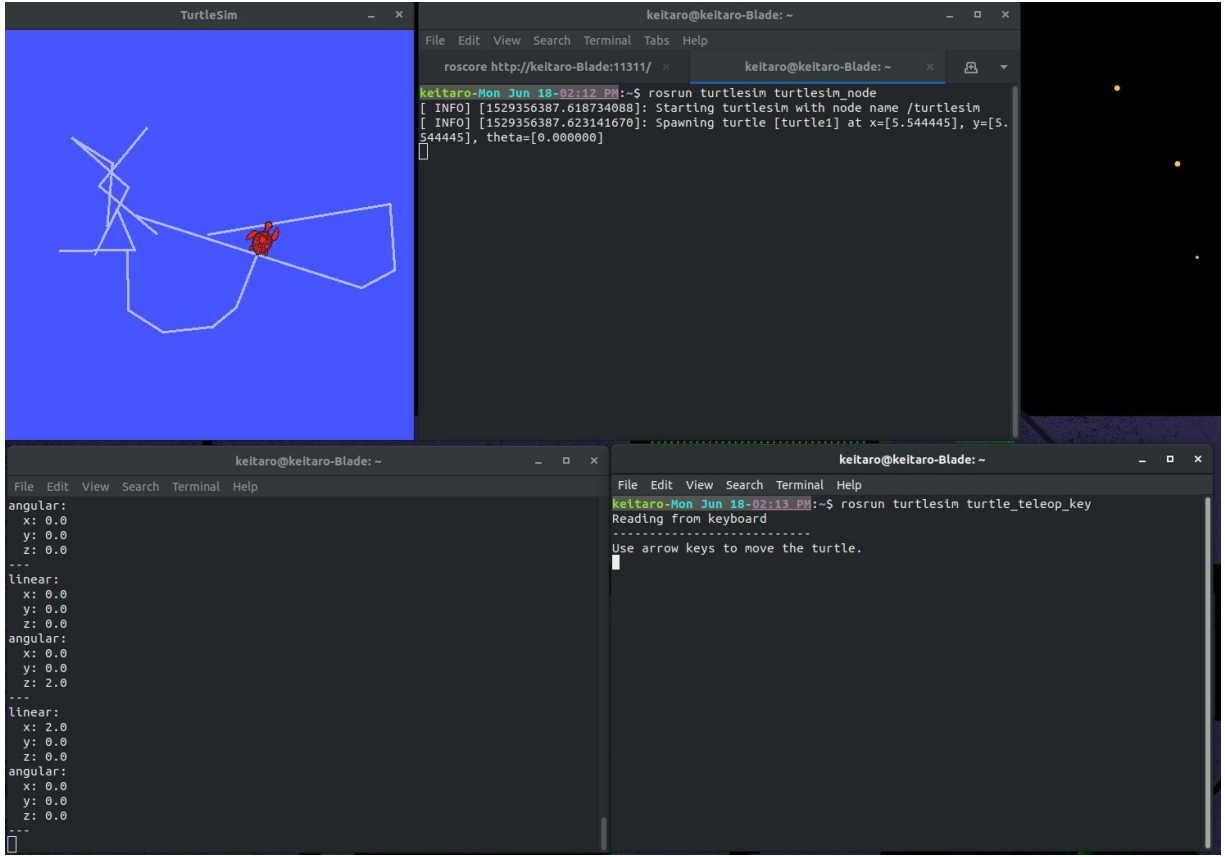
-In a new shell run $ rosrun turtlesim turtle_teleop_key

-In a new shell run $ rostopic echo /turtle1/cmd_vel

-Finally position all of them so that you can see the turtlesim screen and the last three terminals

-Using your arrows keys try to move the turtle around

ROS Concepts



ROS Concepts

-Now open a new shell and run $ rosservice call /clear

-In the same terminal run $ rosservice call /spawn 1 2 3 “test”

-In the same terminal run $ rosparam set /background_g 150

-Then run $ rosservice call /clear

ROS Concepts

In the same terminal run $ rostopic -h

```
keitaro@keitaro-Blade: ~
File  Edit  View  Search  Terminal  Help
keitaro-Mon Jun 18-02:43 PM:~$ rostopic
rostopic is a command-line tool for printing information about ROS Topics.

Commands:
        rostopic bw     display bandwidth used by topic
        rostopic delay  display delay of topic from timestamp in header
        rostopic echo   print messages to screen
        rostopic find   find topics by type
        rostopic hz     display publishing rate of topic
        rostopic info   print information about active topic
        rostopic list   list active topics
        rostopic pub    publish data to topic
        rostopic type   print topic or field type

Type rostopic <command> -h for more detailed usage, e.g. 'rostopic echo -h'

keitaro-Mon Jun 18-02:43 PM:~$
```

ROS Concepts

-Now try running $ rosservice -h

```
keitaro@keitaro-Blade: ~
File  Edit  View  Search  Terminal  Help
keitaro-Mon Jun 18-02:44 PM:~$ rosservice -h
Commands:
        rosservice args print service arguments
        rosservice call call the service with the provided args
        rosservice find find services by service type
        rosservice info print information about service
        rosservice list list active services
        rosservice type print service type
        rosservice uri  print service ROSRPC uri

Type rosservice <command> -h for more detailed usage, e.g. 'rosservice call -h'

keitaro-Mon Jun 18-02:44 PM:~$
```

ROS Concepts

-Finally try running $ rosparam -h

```
keitaro@keitaro-Blade: ~
File  Edit  View  Search  Terminal  Help
keitaro-Mon Jun 18-02:46 PM:~$ rosparam -h
rosparam is a command-line tool for getting, setting, and deleting parameters fr
om the ROS Parameter Server.

Commands:
        rosparam set    set parameter
        rosparam get    get parameter
        rosparam load   load parameters from file
        rosparam dump   dump parameters to file
        rosparam delete delete parameter
        rosparam list   list parameter names

keitaro-Mon Jun 18-02:46 PM:~$
```

ROS Concepts

-These ros commands are useful

-roscd

-rosls

-rosed

How to Make/Build ROS Package

-Catkin (http://wiki.ros.org/catkin/conceptual_overview)

    -The compiler used for ROS code

-Catkin Workspace (http://wiki.ros.org/catkin/workspaces)

    -Build: where the compiler builds the src code

    -src: where the src code for any ros code live

    -devel: a development environment when making install targets

How to Make/Build ROS Package

-Now in a new shell run the following commands:

-$ cd ~/catkin_ws/src

-$ catkin_create_pkg [your name]_test_pkg std_msgs geometry_msgs rospy roscpp

-The format for catkin_create_pkg is

-$ catkin_create_pkg [pkg name] [dependency 1] [dependency 2] …

-You will now see the new package in the src folder

How to Make/Build ROS Package

-In the new package folder you will see the following

-include folder: for any header files you need

-src folder: for the main .cpp or .py files

-CMakeLists.txt: the instructions for catkin on how to build the package

-package.xml: for storing information about the package for ros