

Exercise Session 1

Theory

- ROS architecture
- ROS master, nodes, and topics
- Console commands
- Catkin workspace and build system
- Launch-files

Exercise

Get to know ROS by inspecting the simulation of a Husky robot.

1. Setup the Husky simulation:
http://wiki.ros.org/husky_gazebo/Tutorials/Simulating%20Husky
Remember, our pre-installed ROS distro version (`<distro>`) is `melodic`.
2. Launch the simulation and inspect the created nodes and their topics using (Lecture 1 Slides 11/12):

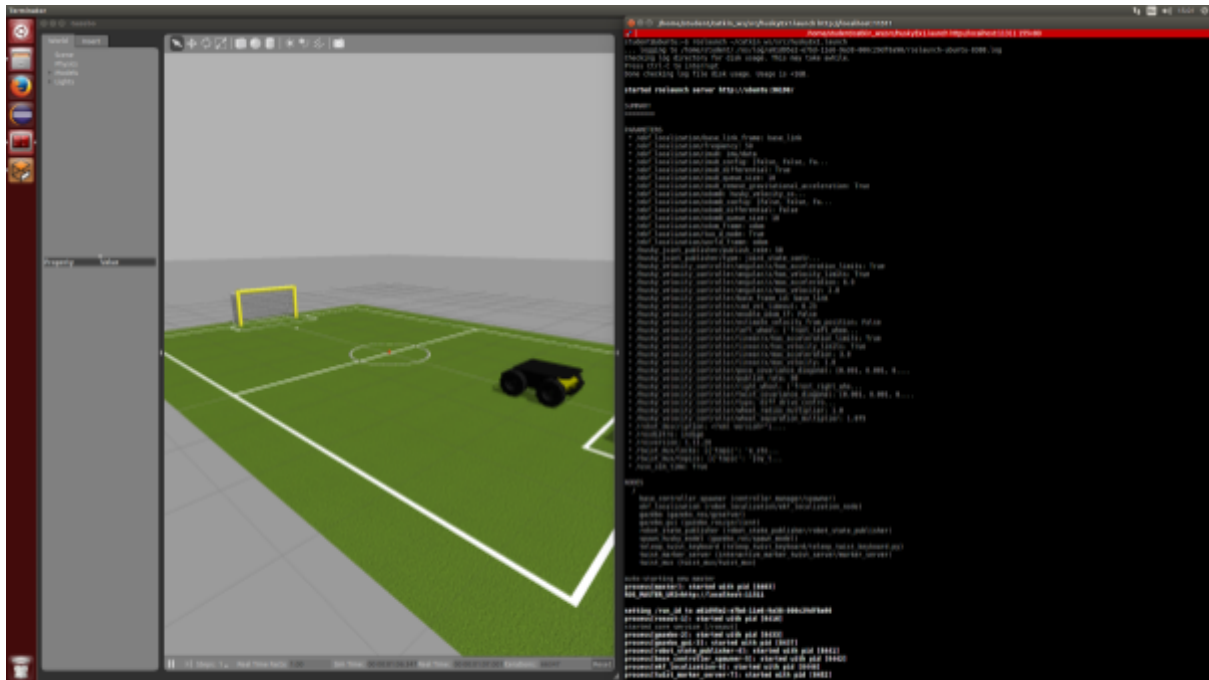
```
roscpp list
rostopic list
rostopic echo [TOPIC]
rostopic hz [TOPIC]
rqt_graph
```

For more information take a look at the slides or:

<http://wiki.ros.org/rostopic>
<http://wiki.ros.org/rosnode>

3. Command a desired velocity to the robot from the terminal (`rostopic pub [TOPIC]`) (Lecture 1 Slide 13)
4. Use **teleop_twist_keyboard** to control your robot using the keyboard. Find it online and compile it from source! Use `git clone` to clone the repository to the folder `~/git`. (Lecture 1 Slides 22-26)
For a short git overview see:
http://rogerdudler.github.io/git-guide/files/git_cheat_sheet.pdf
5. Write a launch file with the following content (Lecture 1 Slides 27-30):
 - husky simulation with a different world:
Include `husky_empty_world.launch` file and change the `world_name` Argument, e.g. `worlds/robocup14_spl_field.world` a world from the directory `/usr/share/gazebo-9/worlds`.

Note: the world_name is with respect to /usr/share/gazebo-9/
- teleop_twist_keyboard node



Left: Gazebo with Robocup14 World, Right: First lines of output when starting the launch file you have to set up

Evaluation

- ❑ Check if teleop_twist_keyboard is compiled from source (roscd teleop_twist_keyboard should show the catkin_ws folder) [40%]
- ❑ Start the launch file. This should bring everything up that's needed to drive Husky with the keyboard as shown in the above image. [60%]

Hints

- If the robot stops again after sending the velocity command, specify the rate of the publisher. Check out `rostopic pub --help`.