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 `kinetic`.

2. Launch the simulation and inspect the created nodes and their topics using (Lecture 1 Slides 11/12):
   ```
   rosnode 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

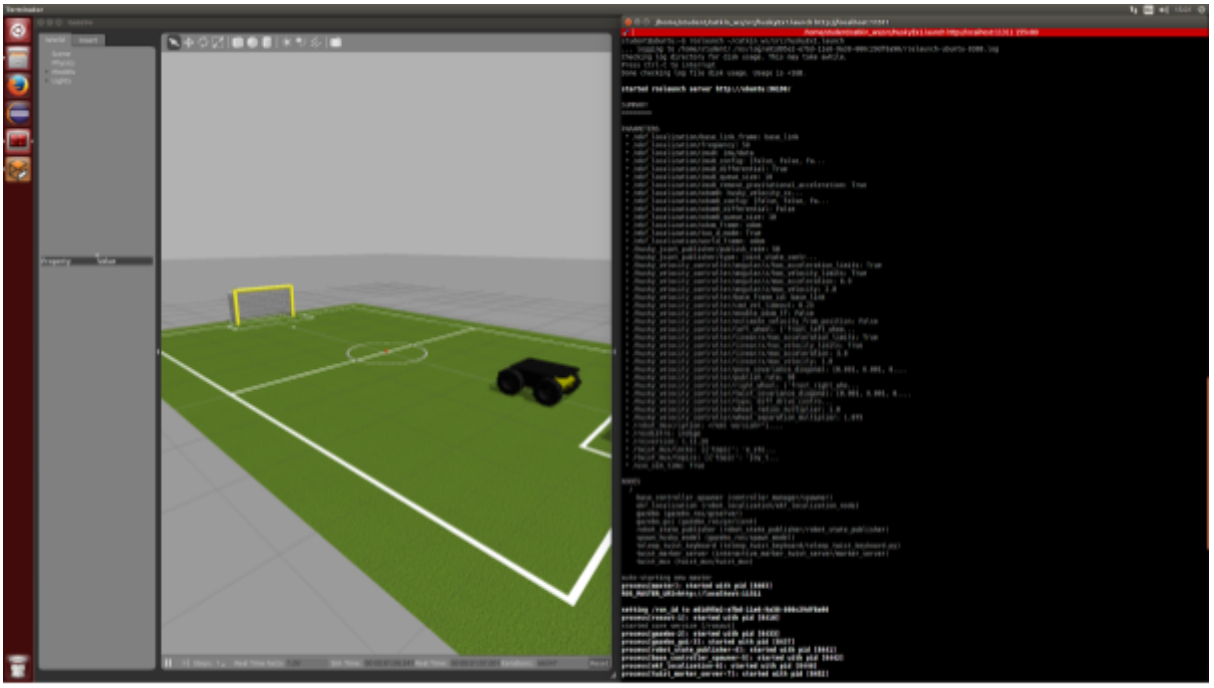
3. Command a desired velocity to the robot from the terminal (`rostopic pub [TOPIC]`) (Lecture 1 Slide 13)

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-7/worlds`.

Note: the world_name is with respect to `/usr/share/gazebo-7/`

- `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`.