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 SuperMegaBot(SMB) robot.

1. Set up the SMB simulation:

Download the smb_common zipped folder on the course website. Unzip it and place it in the ~/gitfolder. Navigate into ~/Workspaces/smb_ws/src and make a symlink. Compile the smb_gazebo package with catkin.

2. Launch the simulation with roslaunch and inspect the created nodes and their topics using (Slides1/2):

- *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])*
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. 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 (Lecture1/2):

- *smb simulation* with a different world:

Include smb_gazebo.launch file and change the world_file argument to a world from the directory /usr/share/gazebo-11/worlds (e.g.worlds/robocup14_spl_field.world). This might take a little while to load the first time. Note that the world_name is with respect to usr/share/gazebo-11/
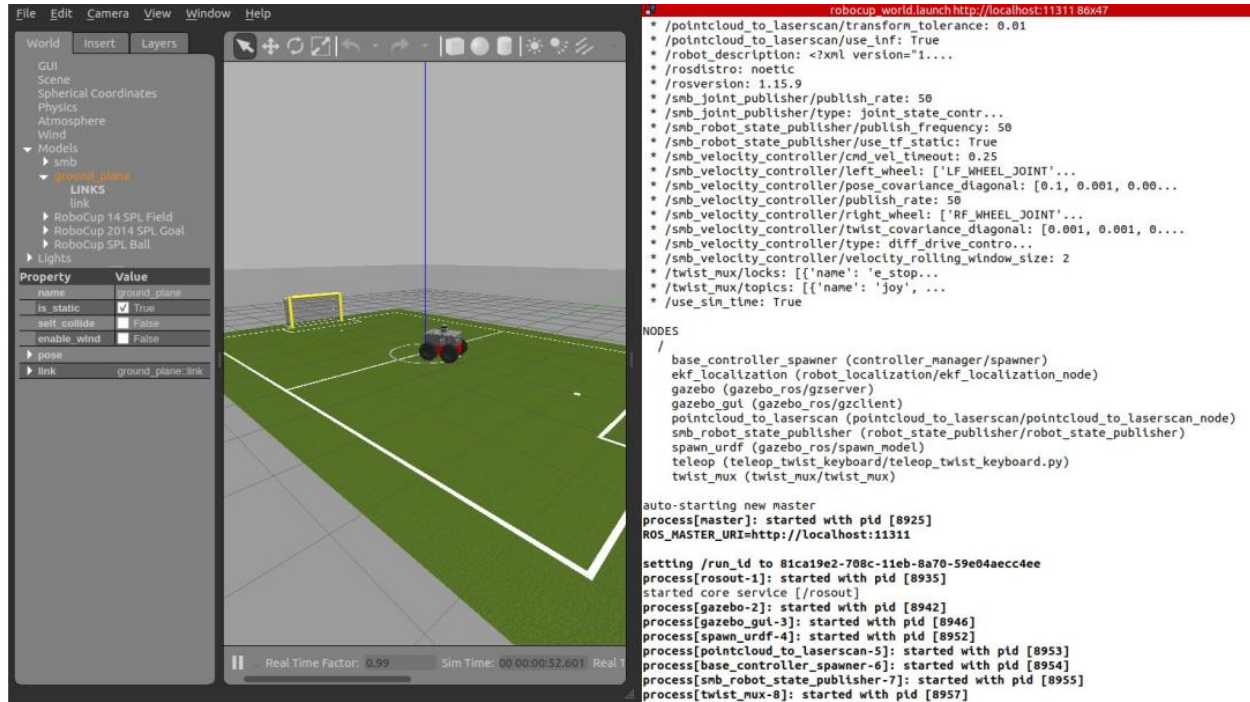
Left: Gazebo with Robocup14 World, Right: First lines of output when starting the launch file you have to setup.

Evaluation

- Check if teleop_twist_keyboar discompiled from source (roscd teleop_twist_keyboard should show the smb_ws folder)
- Start the launch file. This should bring everything up that's needed to drive SMB with the key board as shown in thea bove image.

Hints

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