Department of Computer Science and Engineering

Course Code: CSE461	Credits: 1.5
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Software lab 2

ROS Packages and Topics

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Procedure:

The Task - Driving Husky:

o <u>Workspace Creation</u>: At first we created a ROS workspace named "CSE461_03_02" using catkin_make.

o <u>Package Creation</u>: after that we created a ROS package named "husky_driver" within the workspace to manage project components.

o <u>Husky Node Launching</u>: then we initialized the Husky simulation environment by executing roslaunch husky_gazebo husky_playpen.launch in the terminal.

o <u>Node Creation</u>: next, we created a Python node named follow_path.py within the "husky_driver" package to control Husky's navigation behavior.

o <u>Path Following & Collision Avoidance</u>: finally, modified the code in follow_path.py to enable the Husky to follow the specified path while avoiding collisions with obstacles.

Creating a Catkin package:

```
ubuntu@ubuntu2004:~$ cd ~
ubuntu@ubuntu2004:~$ mkdir -p catkin_ws/src
ubuntu@ubuntu2004:~$ cd ~/catkin_ws/src/
ubuntu@ubuntu2004:~/catkin_ws/src$ catkin_create_pkg topic_demo rospy std_msgs
Created file topic_demo/package.xml
Created file topic_demo/CMakeLists.txt
Created folder topic_demo/src
Successfully created files in /home/ubuntu/catkin_ws/src/topic_demo. Please adjust the
values in package.xml.
ubuntu@ubuntu2004:~/catkin_ws/src$
```

Task 2: Driving Husky

ubuntu@ubuntu2004:~/catkin_ws$ cd ~

ubuntu@ubuntu2004:~$ mkdir -p CSE461_03_02/src

ubuntu@ubuntu2004:~$ cd ~/CSE461_03_02/src

ubuntu@ubuntu2004:~/CSE461_03_02/src$ catkin_create_pkg topic_demo rospy

Created file topic_demo/package.xml

Created file topic_demo/CMakeLists.txt

Created folder topic_demo/src

Successfully created files in /home/ubuntu/CSE461_03_02/src/topic_demo. Please adjust the values in package.xml.

ubuntu@ubuntu2004:~/CSE461_03_02/src$ catkin_create_pkg husky_driver rospy std_msgs

Created file husky_driver/package.xml

Created file husky_driver/CMakeLists.txt

Created folder husky_driver/src

Successfully created files in /home/ubuntu/CSE461_03_02/src/husky_driver. Please adjust the values in package.xml.

ubuntu@ubuntu2004:~/CSE461_03_02/src$ cd .

ubuntu@ubuntu2004:~/CSE461_03_02/src$ cd /

ubuntu@ubuntu2004:/$ cd ~/CSE461_03_02

ubuntu@ubuntu2004:~/CSE461_03_02$

ubuntu@ubuntu2004:~/CSE461_03_02$ roslaunch husky_gazebo husky_playpen.launch

... logging to /home/ubuntu/.ros/log/e5810b62-007b-11ef-b383-f51904208b37/roslaunch-ubuntu2004-3600.log

Checking log directory for disk usage. This may take a while.

Press Ctrl-C to interrupt

Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://ubuntu2004:46001/

SUMMARY
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PARAMETERS
 * /ekf_localization/base_link_frame: base_link
 * /ekf_localization/frequency: 50
 * /ekf_localization/imu0: imu/data
 * /ekf_localization/imu0_config: [False, False, Fa...
 * /ekf_localization/imu0_differential: True
 * /ekf_localization/imu0_queue_size: 10
 * /ekf_localization/imu0_remove_gravitational_acceleration: True
 * /ekf_localization/odom0: husky_velocity_co...
 * /ekf_localization/odom0_config: [False, False, Fa...
 * /ekf_localization/odom0_differential: False
 * /ekf_localization/odom0_queue_size: 10
 * /ekf_localization/odom_frame: odom
 * /ekf_localization/predict_to_current_time: True
 * /ekf_localization/two_d_mode: True