INTRODUCTION TO ROBOTICS LABORATORY
Experiment # 5:
Patrol Movement

OBJECTIVES

The main purpose of this experiment is keeping the TurtleBot3 Waffle Pi moving forward and backward steadily (patrolling).

QUESTIONS

1) Create a folder with the followings.

a) Go to src folder and create a package.**(Hint: cd ~/ , catkin_create_pkg 1512xxxxxxxx_NameSurname rospy geometry_msgs message_generation message_runtime)**
b) After creating package, make compilation for catkin.
c) Add scripts folder to your package which will contain python code. (**Hint:** mkdir)
d) Create a node for the mission**[1]**.(**Hint**: nano code.py)The requirements for the code is following.
1)Import the necessary library: **rospy ,[2] geometry_msgs.msg[Twist] , math[fabs]**
2)Define a function and name it as do_patrol
3)Start a node and publish the speed .(**Hint1 : rospy.init_node('patrol',anonymous=True Hint2:new_variable =rospy.Publisher….**)
4)Define a variable to hold Twist type variables.
5)Define four variable for the robot's speed,distance which robot move,number (how many times robot will go) and a counter to count patrol number.
6)To calculate distance,hold the time instantaneously with second and initialize it a variable(t0,t1) (**Hint: t0 = rospy.Time.now().to_sec())**
7)When the operation is done,use shotdown command to close the loop and print it on terminal.(**Hint: rospy.is_shutdown()**)

e) Go to folder which contains the node and make it executable.(**Hint: chmod**)

2) Execute the empty_world.launch for the TurtleBot3 Waffle Pi and execute the code.py on a new terminal.(The robot must patrol 5 times)

[1] http://wiki.ros.org/ROS/Tutorials/WritingServiceClient%28python%29 ,December 2020.
[2] http://docs.ros.org/en/melodic/api/geometry_msgs/html/index-msg.html ,December 2020.
[3]Muhammed Oğuz Taş,"Yeni Başlayanlar İçin Uygulamalarla Robot İşletim Sistemi (ROS)", December 2020**.**