Turtlebot

***“NEED TO CREATE A PROJECT. FOLLOW ROS TUTORIALS”.***

Programming

- Initialize a node, and listen to all data nodes (localization & IMU & images etc)

- After messages are received, they are matched together with timestamps, and passed to 'odomCallback'

- 'odomCallback' saves the position/IMU data and take images, then command the robot to move using 'move\_robot'. **INSTALL OPENCV** to take the images.

- 'move\_robot' set a new goal if the previous goal is reached, then make proper commands to the robot depends on current position & goal position

- 'set\_goal' sets the next goal

Compile

- use roscd/cd to go to the root of the workspace folder

- there are several executable script to compile & start the robot

run 'ls -l'

look for ones with '-rwxr-xr-x' as permission (x means executable)

- run './makecv' to compile the project 'localize'

Run

- run 'roscore'

- run nodes in this order: IMU, Camera, minimal.launch

- run our own program with 'runcv'

Resource:

Basics

<http://learn.turtlebot.com/>

<http://learn.turtlebot.com/2015/02/01/10/>

IMU calibration

<http://wiki.ros.org/razor_imu_9dof>

There is a package in the ROS workspace that should be modified if IMU needs to be calibrated.

The axis of imu is very confusing, and is different physically & in ROS. And specifications of ROS localization require the readings from IMU to follow certain axis. (The current installation of IMU on the robot is correct with (in ROS program) positive X axis pointing forward, positive Y axis pointing left, Z axis pointing up)

Physical direction & ROS axis readings should be:

cable connector = -x

Circle with axis marker = +y

Bottom (opposite side of the cable connector) = +z

SLAM:

<http://learn.turtlebot.com/2015/02/01/11/>

Change position of the IMU/other parts in the 3D Rviz visualization, so that the TF tree is updated (automatic transformation of a point between coordinate systems is done through TF tree)

<http://answers.ros.org/question/28735/how-to-modify-the-turtlebot-robot-model-in-rviz/>