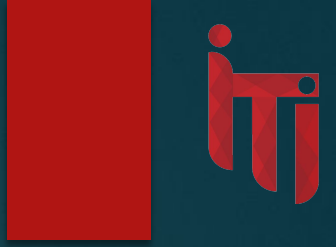


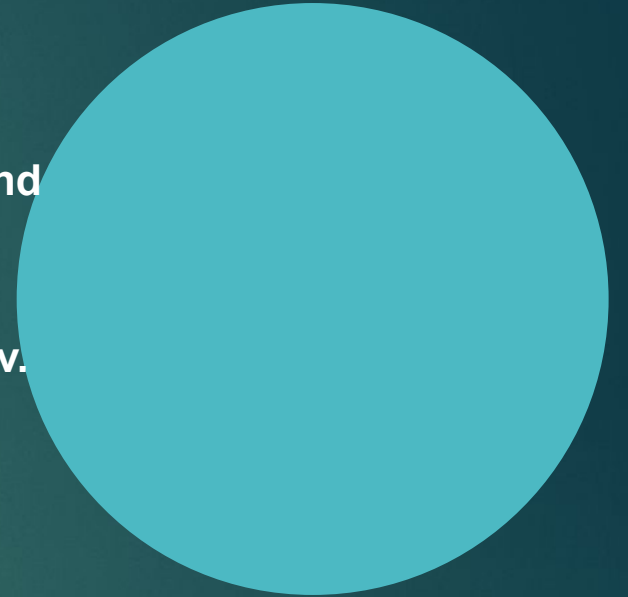
LAB2_Sensors





the attached file (pose.csv) contain position and orientation for magni robot

- launch magni robot in empty world.
- navigate in empty world using teleop_twist_keyboard node.
- reach to required position in csv file.
- subscribe from odom topic to get magni robot position
- compare robot position and csv position then try to achieve csv file position and orientation.
- tolerance in position x,y is 0.5m ,orientation is 5 degrees.
- when reach your goal in x,y,yaw read the next position and orientation from csv.
- when execute all position in csv file print “i execute all position and last one is <x>,<y>,<theta>”



Task2_GPS



The attached csv file (GGA_GST.csv) contains real gps data around ITI. It has 2 nmea messages : GGA and GST.

Optional: see these documentation to know more details about values:

https://www.trimble.com/OEM_ReceiverHelp/V4.44/en/NMEA-0183messages_GGA.html

https://www.trimble.com/OEM_ReceiverHelp/V4.44/en/NMEA-0183messages_GST.html

Use these data to publish gps topic named fix in a frequency 5 Hz.

Important data in GGA message:

Latitude, Direction_of_latitude, Longitude, Direction_of_longitude, HDOP, altitude

Important data in GST message:

Lat_sigma_error(lat_std_dev), Long_sigma_error(lon_std_dev), Height_sigma_error(alt_std_dev)

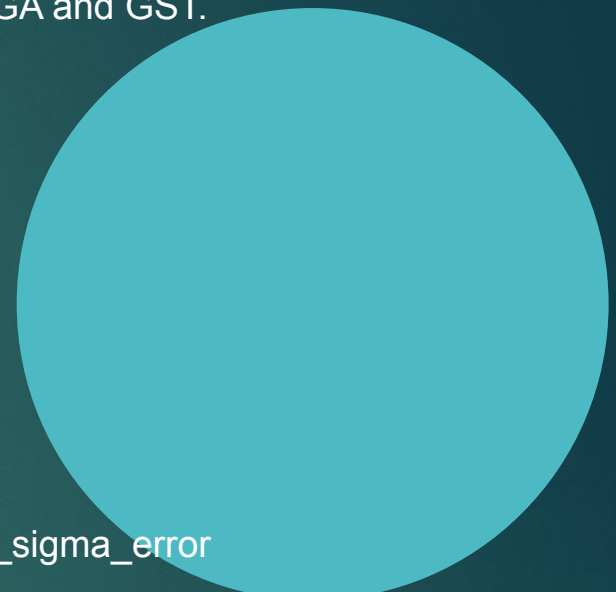
Use these equations to calculate covariance using hdop, Lat_sigma_error, Long_sigma_error, Height_sigma_error

$\text{position_covariance}[0] = (\text{hdop} * \text{lon_std_dev}) ** 2$

$\text{position_covariance}[4] = (\text{hdop} * \text{lat_std_dev}) ** 2$

$\text{position_covariance}[8] = (2 * \text{hdop} * \text{alt_std_dev}) ** 2$

Use publish_gps_message.py as a starter code and check the TODOs.



Instructors repo Link:

- 1- <https://github.com/ahmedgharieb1>
- 2- <https://github.com/M-abdeen>

Material repo :

https://github.com/ahmedgharieb1/ITI_LSV_ROS2

