Robotics I

Odometry

11/09/2021

Final Project

- Construct a “geometry_msgs/Twist” publisher node in ROS2 to drive your robot.
- Given desired linear velocity and angular velocity, control motor speed.
- Remote control your robot using “teleop_twist_keyboard” or “teleop_twist_joy” package.
- Draw triangle, rectangle, circle.
- (Optional) Install appropriate image/camera packages, record videos from first-person view.

Why “geometry_msgs/Twist”?

- Navigation -> Mapping -> Pose, Velocity Estimation

How “geometry_msgs/Twist” Works

- Linear velocity:
  - **x**
  - y
  - z
- Angular velocity:
  - x
  - y
  - **z**

Differential Drive Kinematics

http://www.cs.columbia.edu/~allen/F17/NOTES/icckinematics.pdf

PD Control

https://youtu.be/wkfEZmsQqiA

What's the Problem with Pi's GPIO

- CPU is doing other jobs when running your code.
- Need a separate thread and interruption.
- Or a standalone microcontroller to count encoder steps.

SPI Communication

https://learn.sparkfun.com/tutorials/serial-peripheral-interface-spi/all

LS7366R

https://github.com/fbolanos/LS7366R.git