Control of Mobile Robots
Homework 01

Task 01

Let's try to control the differential drive robot. Consider you are given the following vehicle parameters: sampling period T_s = 0.033s, wheel radius r = 0.04 m, distance between the wheels L = 0.08 m

- Calculate analytically and by simulation the shape of the path done by the robot for the following cases? initial state of the robot you can get by calling self.set_q_init
  - v(t) = 0.5 m/s, $\omega(t)$ = 0 rad/s
  - v(t) = 1 m/s, $\omega(t)$ = 2 rad/s
  - v(t) = 0 m/s, $\omega(t)$ = 2 rad/s
  - wheels angular velocities are $\omega(t)_L = 20 rad/s$ and $\omega(t)_R = 18 rad/s$
- Check that calculated and simulated path the same. Why or why not?
- Plot odometry of the vehicle and how can we reduce the error between desired and actual odometry of the vehicle?