# 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?

# TASK 01

- You are asked to use the provided simulator
  `https://github.com/GPrathap/autonomous_`
  `mobile_robots/tree/master/hagen/hagen_gazebo`
- Your submission should include **the report** and the **source code**