Introduction to Robotics WS18/19 – Version 1.01

8. Assignment: Velocity control and lateral control

1. Velocity controller (5 Points):

Write a PID-controller which makes sure that the model car is able to achieve and maintain a certain velocity, which comes as an input and is specified in meters per second. Use the pulse-sensor in the vehicle as a sensory feedback. The output of the controller shall be an rpm-amount.

Let the car go with 2 different velocities and plot the rpm output over time – paste this plot into your Pdf.

Describe briefly in the Pdf what your approach for the controller was.

2. Control a car on an oval circuit (5 Points):

The field has been prepared with an oval track now. Place the model car on the inner oval (on the beginning of a straight line – in a direction which allows you to go counterclockwise around the track).

Tune your steering PD-controller which you designed in the last assignment so that the car can also go around curves and follow the whole oval circuit.

You can apply a higher velocity when you follow a straight line and reduce your velocity whenever you do not have a long straight line in front of you – therefore use your velocity controller from subtask 1.

Describe briefly in the Pdf what your approach for the steer controller was and how you adjusted your velocity.

Take video of your model car following the trajectory for one lap (max. 5 MB in size).