Trajectory following control and MPC-based path planning for a differential drive robot using feedback linearization

Masterthesis

The aim of the master's thesis is to approximate the dynamics of a differential drive robot using feedback linearization and, based on this, to develop a model predictive control (MPC) strategy. The combination of MPC and feedback linearization should enable the reliable tracking of specified trajectories. The proposed approach will first be implemented in simulations and then analyzed and evaluated using a variety of scenarios. In addition, the system will be extended to include modeled disturbances in order to investigate the robustness of the method.

https://robotics.lindblom.tech/duckietown/

Requirements: Very good math skills, good knowledge of control engineering (SDRT 1+2, MPC and machine learning), programming with Matlab/Simulink or Python, experience with ROS.

Have I sparked your interest? Then feel free to contact me:

Anna Klyushina M.Sc.

Room: S3|10 408
Tel.: 06151 16-25042
Mail: anna.klyushina@tu-darmstadt.de
Web: www.etit.tu-darmstadt.de/ris/klyushina