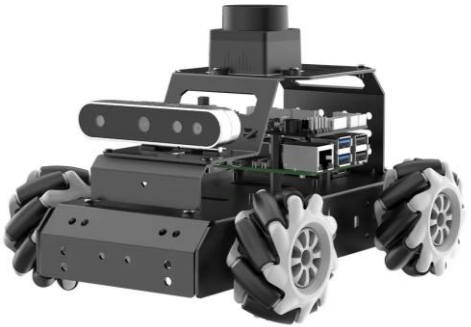
Model predictive control of a holonomic robot with collision avoidance

Masterthesis

TECHNISCHE UNIVERSITÄT DARMSTADT

The aim of this thesis is to develop a controller for an autonomous vehicle that is designed using model predictive control (MPC) and can be implemented on a mobile robot.

The HiWonder MentorPi, which is equipped with Mecanum wheels and is therefore a holomonic robot, serves as an application example for an autonomous system. The use of this platform makes it possible to design and evaluate control methods safely and cost-effectively. First, a trajectory following control using MPC will be developed and implemented on the MentorPi robot. Subsequently, solutions to a specific control problem that addresses the challenges in autonomous vehicle navigation will be developed.



https://www.hiwonder.com/

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:

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