

HILO-MPC: Expanding and Maintaining an Open-source Python Toolbox

Student Assistant Position

HILO-MPC¹ is an easy-to-use, open-source Python toolbox for the flexible development and evaluation of machine-learning-supported optimal control and estimation problems. It provides building blocks to solve a wide range of tasks, from model predictive control (MPC) over moving horizon estimation (MHE) to Kalman filters (KF) and embedded control applications. All of these components offer the possibility to incorporate machine learning (ML) algorithms. The toolbox aims to give an entry point into the abovementioned task and problem definitions for research projects and educational purposes, focussing on simplicity of use.

The offered student assistant position provides a variety of open issues to choose from. Possible tasks may include but are not limited to:

1. Expanding already existent functionality (MPC, MHE, KF, ML, ...)
2. Including new interesting features suitable for the toolbox
3. Study and implementation of meaningful examples
4. Updating the documentation

Subsequent student projects (bachelor's thesis/master's thesis/project seminar) are encouraged.

Prerequisites: Python programming language (basic skills — beginner-friendly),
English (documentation)



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¹ https://www.ccps.tu-darmstadt.de/research_ccps/hilo_mpc/index.en.jsp