# Online-Data-enabled Predictive Control

## Project Summary

Data-based control allows to design a controller without the need to derive a complex system model. The method of Data-enabled Predictive Control (DeePC) was already successfully deployed on quadcopters. However, changes in the environment and system, e. g., wind disturbances or battery power drops, demand to update the data in order to accommodate for the shift in dynamics.

## Project Type

- BA Thesis (6 months)
- MA Thesis (6 months)
- Internship (3-6 months)

## Required Qualifications

- Prior experience with quadcopters
- Basic programming skills in Python

## Contact


- Robin Kensbock, r.kensbock@uni-luebeck.de
- Prof. Dr. Georg Schildbach, georg.schildbach@uni-luebeck.de


## Detailed Description

Based on previous insights gained on DeePC, the goal is to evaluate methods to for updating the Hankel matrices *online* to accommodate for changes in the system dynamics.

The approach shall be evaluated in simulation or experimentally on Crazyflie drones in the Autonomous Systems Lab.

## References


- Elokda, Ezzat & Coulson, Jeremy & Beuchat, Paul & Lygeros, John & Dörfler, Florian. (2021). Data-enabled predictive control for quadcopters. International Journal of Robust and Nonlinear Control. 31. 10.1002/rnc.5686.
- Stefanos Baros, Chin-Yao Chang, Gabriel E Colon-Reyes, and Andrey Bernstein. Online data-enabled predictive control. *Automatica*, 138:109926, 2022. https://doi.org/10.1016/j.automatica.2021.109926.