

## Masterthesis

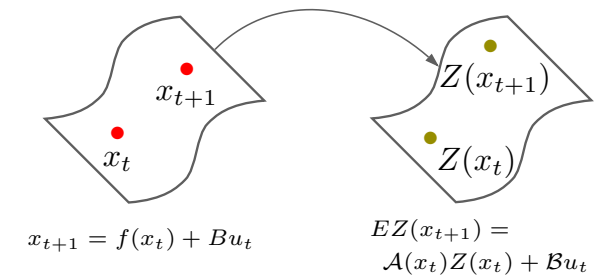
# Nonlinear controller design with performance specifications via descriptor embedding

Nonlinear control is an active area of research. Different nonlinear control strategies have been proposed over the past decades, with each having its own advantages and disadvantages. Recently, the notion of descriptor embedding for discrete-time nonlinear systems was introduced and used for the direct data-driven design of stabilizing controllers. The idea is to represent the dynamics in some higher dimensional space where a function of the state evolves in a linear parameter varying descriptor (LPVd) form. This allows for using the rich theory of descriptor systems to study nonlinear systems and propose new design techniques.

The goal of this thesis is to extend the results to continuous-time systems and design controllers which fulfill certain performance specifications by exploiting existing results from LPVd systems theory. Afterwards, the designed controllers should be compared in simulation against existing benchmark approaches in several case studies.

**Requirements:** Good command of English language, strong background in mathematics, Regelungstechnik (I/II) and Nonlinear Control, as well as very good Matlab/LaTeX skills.

**Starting date:** The topic will be offered starting from mid April 2026.



### Contact

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