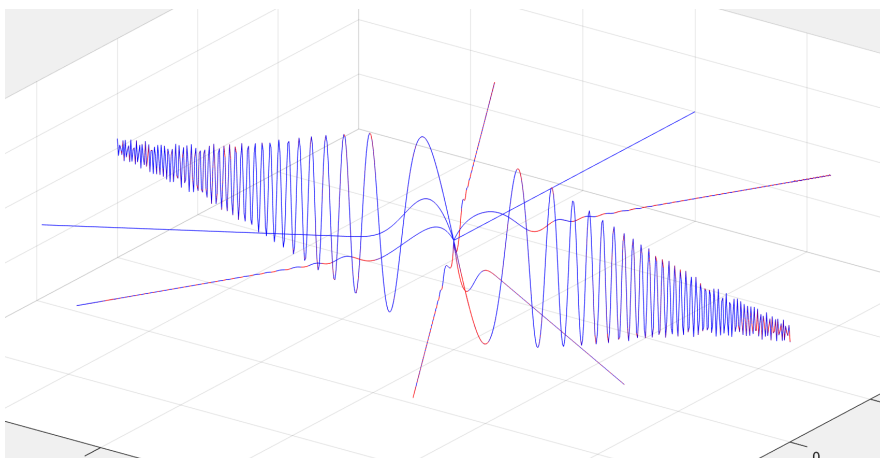


Masterarbeit

Investigating improvements in the K-plane algorithm

Motivation

We have recently developed a new method for applying boundary-value control to linear partial differential equations based in the complex plane. The method first approximates the boundary values as a finite number of basis functions, then uses the Global relation from the Unified transform method to solve for the wanted control at a finite number of points. The method is efficient and shows promise it could be upgraded to also work with classes on nonlinear PDEs. However, there are some possible points of improvement, most notably in the choice of basis function and the location in the complex plane of where to evaluate the functions. Both of these could also be influenced by the choice of PDE, and by other parameters. This thesis would investigate the influence of other possible choices.



The desired function and the approximated control in the complex plane

Problem Statement

In this thesis you will first receive a quick rundown of how the UTM (the basis of the control method) and the K-plane method work. After a small literature study you will start with an action plan, which lines out which parts of the algorithm to investigate and how to optimise these. Recommended starting points are the choice of basis functions, or the evaluation point placement in the complex plane.

Prior knowledge

- Mathematical knowledge and interest
- Some knowledge about modeling
- Experiences with Matlab/Python programming
- Experiences with Complex analysis will help

Research area

- Partial Differential Equations
- Signal Analysis

Studiengang

- ☒ Elektro- und Informationstechnik
- ☒ Mechatronik

Alignment

- ☒ Method development
- ☒ Research
- ☒ Implementation
- ☒ Modelling

Start

From now on

Links

[Mitarbeiter](#)

Contact person

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