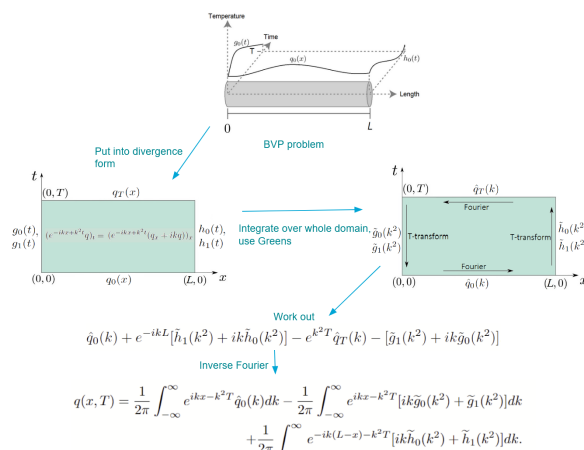


Masterarbeit

The Unified Transform Method on Complicated Domains

Motivation

The Unified Transform Method (UTM) is a relatively new method to solve boundary value problems of partial differential equations. Currently, a lot of research has been done on problems on the 1-D domain, but the more complicated domains (e.g. a 2-D plate, or a series of 1-D domains) have remained quite unexplored. Our aim with this project is implement the UTM on these more complicated domains, starting with only the heat equation. This would be beneficial e.g. for seeing how an object with a complex shape cools. This is currently only done using smaller elements and timestepping, two things that might be avoided using the UTM.



A rough scheme of the UTM

Problem Statement

In this thesis you will first receive a quick rundown of how the UTM works. After a small literature study you will start implementing the UTM on one of the more complicated domain, probably starting with a 2-D plate or a series of connecting rods. This can then be extended to even more complex setups.

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
- Informatik

Alignment

- Method development
- Research
- Implementation
- Modelling

Start

From now on

Links

[Mitarbeiter](#)

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