

# A Comparative Study and Optimization of Symbolic Regression under High-Dimensional Inputs

5. February 2026

Thesis BA/FA  
Supervisor Yang Yang  
Examiner Prof. Dr.-Ing. Bin Yang

## Motivation

Symbolic regression is gaining increasing interest as an interpretable alternative to black-box learning models. However, when applied to problems with high-dimensional inputs, symbolic regression faces significant challenges, including rapidly increasing computational cost and notable performance degradation.

This thesis aims to conduct a comparative study of state-of-the-art symbolic regression algorithms and optimization techniques, with a particular focus on their performance in high-dimensional settings. By evaluating a range of representative approaches on benchmark datasets, this work seeks to identify effective strategies for improving symbolic regression under such challenging conditions and to provide insights into the strengths and limitations of different methods.

## Objectives

- Implement a framework for training and evaluating state-of-the-art symbolic regression algorithms on high-dimensional datasets

## Prerequisites

- Good programming skills in Python
- Experience in ML-frameworks (Preferably PyTorch)
- *Optional*: Took the Deep Learning exam with good results
- *Optional*: Participated in the ISS Deep Learning Lab

If this topic has sparked your interest, write me an email and we can discuss the proposal in more detail. Please include your current transcript and CV.