

# Neural Networks for Friction Modeling (BA/SA/MA)

## Background

Wherever mechanical components are moving friction occurs. Friction is a nonlinear dynamic effect that can affect technical systems considerably and therefore cannot be neglected for controller design. Although various phenomenological models for describing friction effects have been developed over the years, parameter identification remains challenging and often requires special experiments.



The aim of the thesis is to examine how methods from the field of machine learning can be used to enhance phenomenological friction models and to facilitate parameter identification. Measurement data for the drives of a robotic handling system serve as the database. Using the new data-based models, the friction of the drives is to be predicted and corrected.

## Aspects of the Topic

- Reading up on classical friction modeling
- Preparation of the measurement data
- Implementation and training of different neural networks
- Integration of the data-based friction models into the simulation framework
- Predicting and correcting frictional loss (optional)

## Requirements

- Good knowledge in the field of machine learning
- Good programming skills in Matlab und Python
- independent and structured way of working

The thesis can be written in German or English. Feel free to contact me, if you are interested and have any questions.

## Kontakt

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