

Project Thesis

Temporal convolutional networks for brake noise prediction

The Dynamics Group happy to announce that we are currently looking for a highly motivated, independently working and ambitious student for a project thesis. Within a new research project we develop an AI-driven brake system control strategy for electrified vehicles. Using deep learning, we aim at predicting the friction sounds and brake particle emissions of real braking systems in collaboration with automotive manufacturer and suppliers, such as AUDI AG, VW AG and Hitachi Astemo.

This thesis aims at implementing temporal convolutional networks for predicting friction sounds of real world brakings systems. This relatively new set of neural network architectures was developed to predict time-series data and has been demonstrated to integrate longer memory than other recurrent architectures, making it interesting to our prediction task, where long-term history often plays a vital role.



Project milestones:

- Detailed literature survey on temporal convolutional networks (TCN)
- Implementation of a TCN for a nonlinear prediction task and integration into the project Python module
- Conduction of hyperparameter studies to identify important algorithm parameters and suitable values for the prediction task at hand
- Documentation, description and interpretation of the results, writing a thesis report

Your profile and skills:

- Demonstrated programming skills in Python, tensorflow, and related libraries
- Knowledge of nonlinear structural dynamics, vibrations and convolutional nets
- Structured way of thinking, working, and communicating

Interested? Please contact: Charlotte Geier (charlotte.geier@tuhh.de)