



Angewandte Elektronik- und Softwaresysteme

Prof. Dr.-Ing. Karl-Ludwig Krieger

Student projects

Investigations into the development of data transfer models

Project description:

The aim of the research project is to implement acoustic condition monitoring for the gearbox in hybrid van carriers. The overall system consists of the acquisition of acoustic signals and an algorithm-based evaluation of these for monitoring the bearing and gear components in the gearbox.

The main problem in the project is the small database. Particularly in the monitoring of mobile machinery, the measurement of reference data in the field is not possible to the full extent due to high costs and limited availability. In contrast, measurement on test benches is often feasible to a greater extent. This is also the case in this project. The correlation between the test bench environment and the real application is therefore to be investigated in order to realize a possible data transfer between these environments (domain transfer).

Scope of work:

A selection of possible transfer models has already been developed and initially implemented as part of previous studies. In addition, a designed neural network is currently being tested on a larger data set. Several of the following investigations should be covered in the student work. We can discuss the scope and selection of topics individually depending on the type of work and interests. Your own ideas on this topic are also very welcome.

Possible Investigations:

- Investigation of signal differences between the domains
- Testing of methods at signal level (noise adding, spectral subtraction, etc.)
- Framework for parameter optimization of the neural network
- Framework for validating and evaluating the transfer data
- Transfer of the domain transfer models to a class-based transfer
- Side investigations on the influence of various parameters, e.g. size of the training data set

Prior knowledge:

- Basic knowledge of Python
- Knowledge of Deep Learning is advantageous, but not necessary
- Reliability and motivation to research

Target group:

Master project CIT/CMM	Master thesis CIT/CMM		
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Topics:

Software	Data processing	Acoustic	Deep learning
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Contact:

Julia Scholtyssek
 Tel.: 0421 218 62562
 E-Mail: julia.scholtyssek@uni-bremen.de
 NW1, Raum W3190