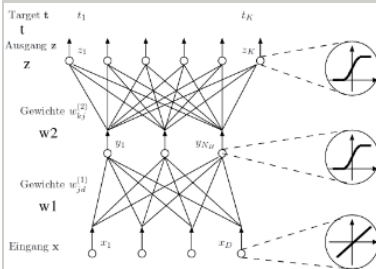


Machine Learning for Bearing Fault Classification and Regression



Structure of a feed forward neural network



Ball bearing failure

Ansprechpartner:



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Scope:

Bearing failure is considered as one of the major causes of rotating machinery breakdown. A key research area at the chair of dynamics and mechatronics (LDM) is the application of machine learning algorithms to diagnose failure and predict the remaining useful life of technical systems in general and bearings in particular. Reliable and accurate diagnostics and prognostics has the potential to improve system reliability, availability, safety and economic performance by minimizing scheduled maintenance and reducing downtime.

The main objective of the below summarized tasks is not necessarily the implementation of new methods, but the efficient application of existing methods on available experimental and real world data.

Possible tasks are:

- Robust feature extraction from raw sensor data such as vibration, current and temperature measurements.
- Evaluation of feature selection techniques for classification and regression tasks.
- Hyperparameter optimization techniques for algorithms such as Support Vector Machines (SVM) and Extreme Learning Machines (ELM).
- Application of deep learning algorithms for unsupervised fault classification.

Prerequisites:

- A desire to learn and explore new fields
- Prior programming skills (preferably in MATLAB)
- Knowledge of signal processing is recommended but not essential
- Basic knowledge in machine learning and data analysis is recommended but not essential

Die Arbeit kann auf Deutsch geschrieben werden!

Bei Fragen und / oder Interesse an dieser Arbeit wenden Sie sich bitte an den nebenstehend genannten Ansprechpartner.