



## Machine Learning – Developing an artificial neural network (ANN) to investigate the fatigue resistance of steel structures

Machine learning algorithms, especially artificial neural networks (ANN), gain increasing importance in research when analyzing big data. Thereby, ANNs can be used to estimate the fatigue resistance of various constructional details in steel structures.

**Aim of the thesis is to develop an ANN, that can be used to predict the fatigue resistance of welded, constructional details.**

An existing experimental data base of fatigue tests can be used to obtain suitable training data. After validation, the ANN should be used to investigate various parameters on the fatigue resistance.

### The key tasks include:

- Data Categorization & Preprocessing
- Identify key parameters influencing fatigue resistance
- Machine Learning Model Development
- Training an artificial neural network (ANN) using the experimental fatigue test results
- Optimize and validate the ANN for accurate predictions

### Requirements:

- Fundamental knowledge in programming and machine learning
- Basic knowledge in fatigue of steel structures
- High degree of independence

## Masterthesis

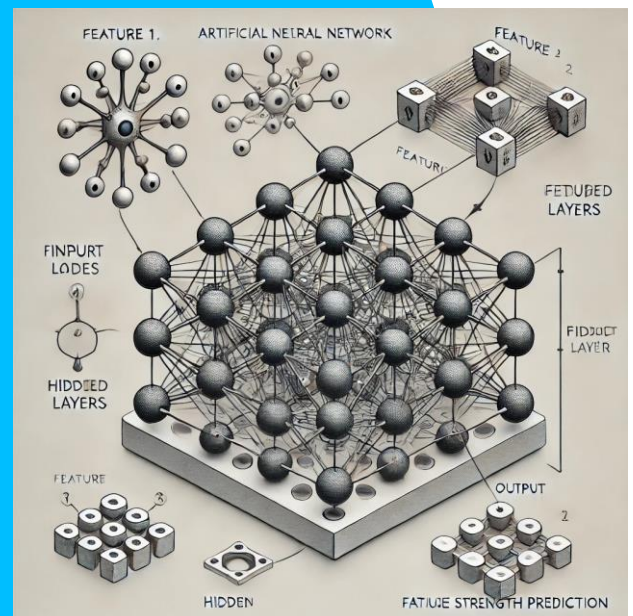


Figure generated by AI

Fatigue &  
Computational  
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