

## Masterarbeit

# Uncertainty quantification in models

### Motivation

The current research project Circular Factory aims to realize the vision of the perpetual product by transferring used products into new product generations. In this broad-based project, various sensors are used to measure the used products. The measurements will then be used to decide whether the object is still functional and can be reused in a new product or not.

This heterogeneous data is merged with each other to make the decision.

### Task definition

The task aims to determine an uncertainty quantification in a model.

The measured attributes in the Circular Factory contain an uncertainty, which is aleatory uncertainty. The model to determine a certain value is also subject to uncertainty and contains the epistemic uncertainty.

The model is to be carried out using the example of fatigue strength. Various data are recorded for the fatigue strength: Material composition, surface defects and temperature data during a welding process. These data have an influence on the fatigue strength.

The aim of the work is to develop a model for the fatigue strength and to determine the uncertainty of the fatigue strength from the measured data. Among other things, a Monte Carlo method can be used for this purpose.

### Preknowledge

- Programming knowledge e.g. Python, Matlab
- Interest in collaboration with ongoing research project
- Interest in measurement technology

### Forschungsgebiet

- Measurement technology
- Daten processing
- Datafusion

### Studiengang

- Elektro- und Informationstechnik
- Informatik
- Mechatronik

### Ausrichtung

- Methodenentwicklung
- Messung
- Entwicklung
- Implementierung
- Signalanalyse
- Recherche

### Start

Ab sofort

### Links

[Forschungsprojekt](#)  
[Mitarbeiter](#)

### Ansprechpartner

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