Master Thesis
Centre for Construction Materials (MPA-IfW)
Department of Surface Technology

Scope:
6 Months

Workplace:
TU Darmstadt Stadtmitte
Institut für Werkstoffkunde
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Required documents:
Motivation/cover Letter,
Curriculum Vitae,
Studienbescheinigung,
Transcript/Leistungsspiegel

Begin:
2022-03-01

Date Posted:
2022-01-27

**Master thesis in research field: Aluminum based pitting corrosion prediction at elevated temperatures in renewable fuels**

Motivated student who self-reliantly works on a project branch related to material compatibility with sustainable biogenic/synthetic next generation fuels. This research deals with experimental and simulative description of temperature-induced pitting corrosion of automotive-relevant aluminum alloys. We would like to explore the effect of alloy microstructure on the pitting initiation using artificial neural networks and image recognition.

**Your Tasks**
- Experimental creation of data space for pure aluminum AA1050 alcoholate corrosion by systematic change of descriptors
- Development and documentation of a predictive data and image based model
- Validation of model with independent experiments

**Requirements**
- Experience with Python and scientific packages like pandas, scikit, numpy, pytorch etc.
- First insights into Machine Learning/Deep Learning/Image Recognition algorithms
- Motivation to explore new workflows and create new ideas
- Knowledge of corrosion processes and accurate lab work skills