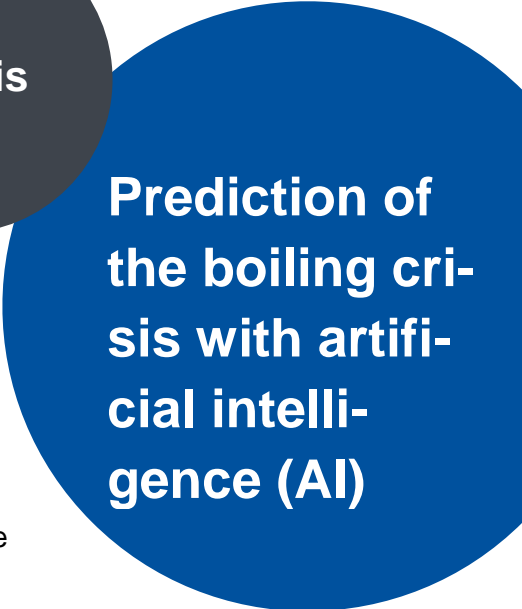




Thesis



**Prediction of
 the boiling crisis with artificial intelligence (AI)**

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Prediction of the boiling crisis with artificial intelligence (AI)

The occurrence of a boiling crisis in thermohydraulic systems leads to a drastic deterioration of the heat transfer and thus to a rapid and significant increase in the wall temperature. Since this can lead to the destruction of the heating surface, knowledge of the occurrence of boiling crises is highly relevant for the safe design of power plants. Common methods for estimating the limiting critical heat flux are look-up tables, empirical correlations or mechanistic models. Recently, there has also been increasing interest in the use of AI methods to predict the boiling crisis

After familiarization with the theoretical principles of the boiling crisis, a machine learning model is to be developed. In particular, it will be tested whether and to what extent such models are able to predict the boiling crisis for different fluids. The basis for the model is an existing database with over 30,000 data points. The performance of the machine learning model is to be compared with the performance of conventional prediction methods by developing a suitable evaluation logic.

Approach:

- Familiarization with the topics of boiling crisis and artificial intelligence
- Expansion of the database to include further literature data for non-water fluids
- Implementation and testing of the AI model
- Evaluation of the results
- Tools: Python, Excel

Requirements:

- Interest in data and artificial intelligence
- Good German or English language skills
- Creativity and self-motivation

Start: flexible

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