



Hybrid Machine Learning models for prediction of dynamic biogas production

The accurate prediction of dynamic biogas production is of significant importance for achieving energy security in the near future. While machine learning and neural networks have been widely recognized as suitable methods for optimal prediction, there are still several aspects that require further investigation.

Although the performance of conventional models such as LSTM, GRU, and Random Forest in predicting biogas time series has been well-documented, the combination of such models or the utilization of lesser-known models remains largely unexplored. Furthermore, the minimum amount of data required for these models to achieve satisfactory performance is still uncertain.

The objective of this master thesis is to implement, apply, and evaluate hybrid machine learning/deep learning models or novel models for predicting biogas production, with a particular emphasis on determining the necessary data for accurate performance.

Requirements:

- Sound experience with python
- Minimal experience with python packages such as TensorFlow, Keras and Scikit-Learn
- Existing knowledge regarding machine learning and neural networks

Contact person:

Alberto Meola
DBFZ, Torgauer Straße 116, Haus 6, Raum 207
alberto.meola@dbfz.de