

# Bachelor's/Master's thesis

## State estimation and process monitoring of agricultural biogas plants



### BACKGROUND:

The more than 9000 agricultural biogas plants in Germany are likely to be operated dynamically in the future in order to balance demand peaks in a fluctuating renewable energy grid. This induces the risk of reactor instability. To guarantee safe operation, the dynamic state of the reactor needs to be known at all times. For this purpose, different state estimation methods (in particular Kalman filters) are to be implemented in simulations.

### YOUR TASKS:

- Familiarize yourself with the topic and methods (modelling of anaerobic digestion processes, state estimation with extended and unscented Kalman filters)
- Implement Kalman filters in Matlab
- Compare different model classes and state observers

### YOU HAVE:

- Foundational knowledge in math and control theory
- Elementary knowledge in programming with Matlab and thermodynamics
- If possible: Elementary knowledge in modelling and identification of biological systems

### WE OFFER:

- A good introduction to the topic as well as competent and motivated support in the processing of the tasks
- A family-friendly, modern working environment in a collegial working atmosphere
- A well-equipped workplace and advanced lab infrastructure
- Good public transport connections

### BEGINNING:

1 November, 2022

### DURATION:

3-7 months (depending on degree)

### LOCATION:

Deutsches Biomasseforschungszentrum, Torgauer Straße 116, 04347 Leipzig

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### APPLICATION DOCUMENTS:

Please submit your compelling application (only in a single attachment, preferably as pdf, max. 5 MB)  
**e-Mail: [bewerbung@dbfz.de](mailto:bewerbung@dbfz.de)**

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