Friedrich-Alexander-Universität
Institute of Autonomous Systems and Mechatronics | ASM

17.10.2025

Research Internship

Building a test bench for evaluating process behavior and system identification in a Bioreactor


[2]

With the patented Tissue Regenerator, a platform is being established to further advance the automation of tissue engineering [1]. The goal of this research internship is to gain an improved understanding of temperature distribution, shear forces, and mixing processes, particularly within the main chamber of the Tissue Regenerator. To achieve this, you will build a simplified version of the reactor which should be used as a test bench. For this you will also propose different sensors which should be included in this test bench. Later this setup should be used for a Data based identification of the system dynamic.

Task Description

- Evaluation of literature on reactor design
- Building simplified version of the main chamber (including inlet, outlet, stirrer, heating element and dummy geometry representing the tissue)
- Propose sensor suite and include first sensors
- Use sensors for system identification

Profile

- Interested in hands on work
- Basic knowledge of/interested in prototyping (CAD design, Arduino/Raspberry Pi)
- Interested in data based system identification and modeling
- Independent working style

References

- [1] https://www.mbt.tf.fau.de/research/research-groups/bioreactors-in-tissue-engineering/the-myoreactor-prototype/
- [2] https://www.validierungsfoerderung.de/validierungsprojekte/gewebe-regenerator
- Paul, E.; Atiemo-Obeng, V.; Kresta, S. (2004). Handbook of Industrial Mixing – Science and Practice. Wiley Interscience.
- Salho, A.; Hamzah, D (2024). A Review of Stirred Tank Dynamics: Power Consumption Mixing Time and Impeller Geometry. International Journal of Heat and Technology.

If this caught your interest, please contact me at niklas.buente@fau.de.

Registration: 01.10.2025

Submission: 01.02.2026

Examiner: Prof. Dr.-Ing. habil. Philipp Beckerle

Supervisor: M.Sc. Firstname Lastname

Co-Supervisor: M.Sc. Firstname Lastname

Student: Firstname Lastname