



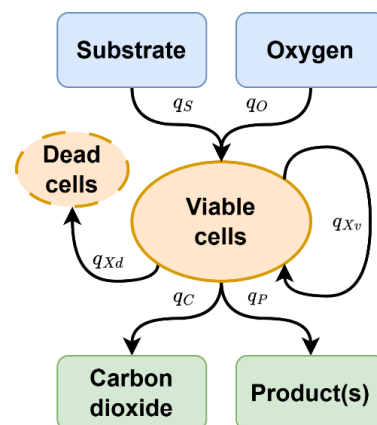
Master Thesis in Modelling of Bioprocesses

Generic System Identification of Bioprocess Models

To strengthen our team at the [Vienna site](#) we are seeking young and skilled scientists with finished BSc degree in the field of informatics, data-science, mathematics, control, biotechnology, process engineering, or a related field for pursuing their master's thesis with immediate entry on part-time basis (20h/week), limited to 6 months. The offered monthly salary is EUR 1.299,06.

Bioprocesses facilitating the microbial or biocatalytic production of chemical molecules, such as proteins or enzymes for the pharmaceutical, cosmetics or food industry, are inherently complex biological systems involving numerous pathways, molecules and compounds as well as diverse host organisms, target products and process modes.

Within this thesis, it is the goal to develop an algorithm that will identify the key kinetics of bioprocess models from experimental data, thus allowing faster and automated model transfer. When the kinetics of the process are known, a pure parameter fit suffices, while, if the kinetics are not known, a simultaneous fit of model parameters and kinetics must be applied. In case none of the available equations can describe the kinetics to a reasonable extend, it is necessary to generate new kinetic equations.



$$q_i(x, t, \theta) = \begin{cases} p \\ q_{imax} \cdot \frac{x_i}{K_i + x_i} \\ q_{imax} \cdot \frac{x_i}{K_i + c_i + \frac{x_i^n}{K_i}} \\ q_{imax} \cdot \frac{x_i}{x_i + K_i \cdot \left(1 + \frac{x_j}{K_j}\right)} \\ \vdots \end{cases}$$

For further details see the next pages

We are looking forward to hearing from you: personal@chasecenter.at

Place of employment: 1030 Vienna

Reference number: 018

Application: until 17.03.2025

CHASE your future

You will contribute to the following tasks:

- Development of an algorithm for the simultaneous fit of reaction kinetics and model parameters.
- Development of an algorithm for the generation of new kinetics from data.
- Development of these algorithms using both noise-free and noisy simulated data before testing on real process data (*experimental data generation is not part of this thesis*) of different processes to show robustness and the generic applicability of this approach.

Your expertise:

- Bachelor's degree in informatics, data-science, mathematics, control, biotechnology, process engineering, or a related field.
- Experience in data-science and application of algorithms for parameter fitting and optimization.
- Proficiency with a programming language (e.g. Julia, Python, Matlab).
- Ability to collaborate effectively with cross-functional teams.
- Strong communication skills in German or English, both verbal and written.

CHASE your career

We are committed to providing a framework for your professional growth:

- State of the art research with focus on digitalization (Industry 4.0).
- Collaborate with research experts and academic leaders, gaining practical experience.
- The possibility to apply your research skills in an application-oriented and industry-relevant context.
- Receive a competitive salary for your contribution to the project and master thesis.

For further information, please contact:

Jan Niklas Pauk, Senior Research Scientist – Bioprocess Digitalization

niklas.pauk@chasecenter.at

We look forward to receiving your application (cover letter, CV, academic certificates, employment references), including the reference number of the job posting, to the following email address:

personal@chasecenter.at

By submitting your application documents, you expressly consent to the transmission of your application documents to the partners involved in CHASE.

Application: until 17.03.2025



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