



Institute for Automation and
Applied Informatics (IAI)

**Earliest start:
08.01.2024**

Master's Thesis

Title: Real-time Image Segmentation & Tracking in Live Cell Microscopy

Segmentation, as well as tracking, are two major tasks of biomedical image analysis, particularly for live cell microscopy data. While offline analysis of such data is being made possible through tools such as [microbeSEG](#), online analysis still suffers from problems such as high inference times, and low scalability.

In the scope of the [EMSIG](#) project, suitable segmentation & tracking models for images of microbes are to be built and speed-up.

Tasks

The investigation should cover the following aspects,

- Literature research on state-of-the-art segmentation & tracking methods, focusing on biomedical image data.
- Benchmarking of the researched segmentation & tracking approaches on dataset based on predefined KPIs (Key-Performance-Indicator).
- Inference time improvement of a selected method.

Requirements:

The following skills, abilities, and knowledge are necessary:

- Studies in Computer Science / Engineering or related fields
- Ability to work independently.
- Basic knowledge in deep learning and image processing.
- Experience with programming in Python.
- Experience with image processing libraries in Python such as OpenCV.
- Experience with Python-based deep learning frameworks (PyTorch, JAX, or TensorFlow).

Interesting for you? Please send an e-mail with your resume and transcript of records to the contact person below.