



Institute for Automation and Applied Informatics (IAI)

**Earliest start:  
now**

## Master's Thesis

# Title: Detection and Behavior Analysis of Zebrafish using Deep Learning

Zebrafish are an important model organism for different research areas, such as vertebrate development, toxicology and cancer research. The goal of the Master's Thesis is to develop an automatic system that can get an accurate count of the number of zebrafish in a tank, track the individual zebrafish and provide an evaluation whether the behavior of the fish is normal.



The investigation will also cover the validation of a camera system, that is devised to provide a sharp image of the entire depth of the tank. The work will be done in close collaboration with the Institute of Biological and Chemical Systems – Biological Information Processing (IBCS-BIP).

### Tasks:

- Literature search for detection, tracking and behavior analysis for (zebra)fish
- Develop a system for
  - Automatic detection of zebrafish in a tank
  - Tracking of individual zebrafish
  - Behavior analysis using the tracking data
- Evaluate the system

### Education, Experience, and Skills:

Studies in Computer Science, Engineering or related field  
Basic knowledge in Deep Learning and Image Processing  
Experience in programming with Python  
Experience with Deep Learning Framework (PyTorch, TensorFlow)

The thesis can also be done in German.

If you're interested, please send an e-mail with your resume and transcript of records to [thomas.lautenschlager@kit.edu](mailto:thomas.lautenschlager@kit.edu).