

# Ausschreibung Bachelor- / Master-Arbeit

## Sequential Monte Carlo for Multi-Rodent Tracking using Segmentation Heatmaps

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### Hintergrund / Background

Automated laboratory animal tracking aids medical experts and biologists to reduce the use and enhance welfare monitoring of animals. By improving the accuracy, efficiency and reproducibility of research, automated tracking based on deep learning can help reduce the number of animals needed for scientific studies. Robust posteriori analysis of the experiments can help reduce interventions that causes distress or discomfort to animals.

### Aufgaben / Tasks

- Get familiar with the tracking domain.
- Investigate different semantic segmentation methods.
- Literature review on Sequential Monte Carlo (SMC).
- Investigate and design ways for the use of SMC on the tracking task (limitations: overlapping rodents and inaccuracies in the segmentation output).

### Voraussetzungen / Your Profile

- Strong mathematical background **is required**.
- Programming skills in Python are a plus.
- Deep Learning knowledge is a plus.

### Unser Angebot / Our Offer

Our institute features a cluster with 2000 CPU cores and 100 GPUs. We have more than 12TB of RAM and 1TB of VRAM available for computationally demanding tasks.