Active machine learning and regression models for large scale 3D biological image data

The BIOMAG has an opening for a Ph.D. researcher in machine learning to work on cutting edge problems in developing novel active learning and regression models for 2/3D high-content image data of single cells. We are interested in interactive machine learning methods that ask fewer more intelligent questions from the field expert and improve analysis results most. During biological processes cells often undergo continuous changes, and supervised classification methods fail to properly model them. We aim to model these processes using (weakly) supervised regression models. The developed methods will be applied in neurobiology and cancer related studies. The algorithms will be integrated into our novel single-cell extraction system.

The Candidate will be the part of our applied machine learning subgroup. The project aims to develop novel methods to detect and describe behavioural and functional changes of cells in 2/3D microscopic images. The major focus will be on how the combination of active learning and semi-supervised learning strategies (regression and classification) can improve and accelerate biological discovery.

The successful Candidate has/is a:
- Masters degree in computer science, mathematics, physics, bioengineering, or similar fields.
- Knowledge in machine learning is a plus
- Team player with initiative who is also able to work independently
- Proficiency in both written and spoken English is a must
- Interest in biological applications
- Good programming skills
- Experience with active learning, semi-supervised learning, or energy minimization techniques is a strong plus
- Strong background in mathematics and statistics is a plus
- Programming in Matlab or Python and basics in R, C++, and Java are plus

Please remember that we seek for students who consider Ph.D. not as an 8h job but as a passion.