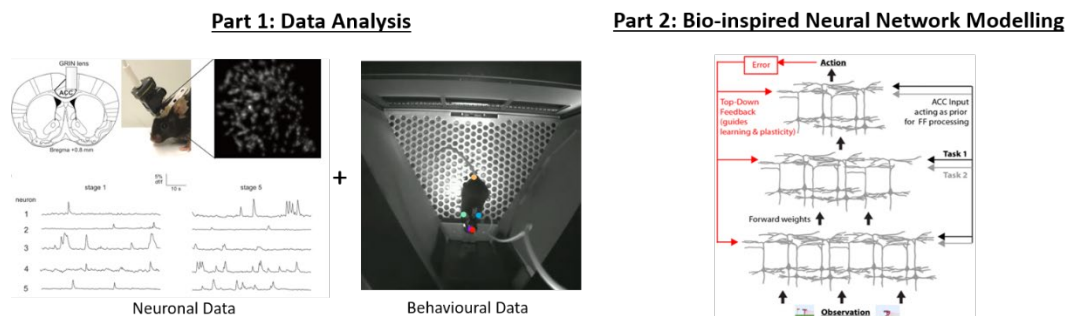## Master Thesis/PhD Position: Rapid Adaptive Task Learning Inspired by Hierarchical Networks

The Grewe lab at the Institute of Neuroinformatics is seeking a highly motivated Master's or PhD student to join our research team to work on understanding the mechanisms of rapid task adaptation in biological brains. This research will specifically investigate the role of the anterior cingulate cortex (ACC) in updating task-specific schemata through modular neural representations. Our goal is to enhance the understanding of how biological brains integrate new knowledge while maintaining prior information, and to leverage these findings to improve AI systems. In this project, the candidate will analyze an existing dataset and apply the insights to develop bio-inspired DNN models.

Part 1: Data Analysis — Neuronal Data + Behavioural Data

Part 2: Bio-inspired Neural Network Modelling

Research Focus:

- Conducting advanced data analysis of behavioral data and neural correlates of behavior to investigate the ACC's role in rapid task adaptation.
- Exploring modular neural representations for task-specific schema updates.
- Applying biological insights to develop bio-inspired AI systems.
- Enhancing machine learning algorithms for better task generalization and learning efficiency.

Ideal Candidate:

Ideally Master Thesis Project leading to a PhD, direct PhD entry is also possible. Candidates with a background in Computational Neuroscience, Bioinformatics, Data Science, or Computer Science and a strong interest in Neuroscience are encouraged to apply.

Required Skills:

- Proficiency in Python
- (Matlab experience is a plus)
- Familiarity with Git version control
- Experience in Modelling (Deep Neural Networks)
- Strong statistical knowledge

Contact:

Prof. Benjamin Grewe, bgrewe@ethz.ch, Dr. Elisabeth Abs, eabs@ini.ethz.ch, Roman Boehringer, roman@ini.ethz.ch