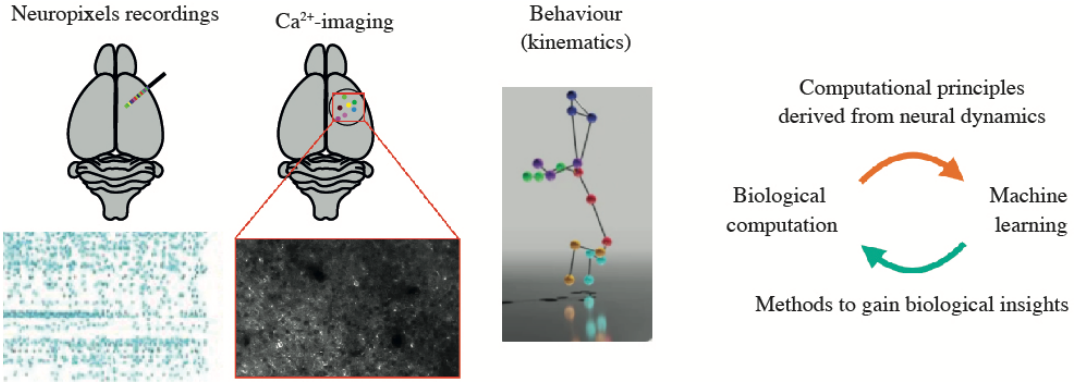

# PhD Position

## Machine Learning Theory for Neuroscience




**Where:** Dynamics of Neural Systems Lab, **Medical University of Vienna**
**Funding:** up to 4 years, PhD Program Medical Informatics, Biostatistics & Complex Systems
**Supervisor:** Dr. Adam Gosztolai
**Starting:** 1/3/2024 or later
**Website:** adamgosztolai.wordpress.com
**Apply**: bit.ly/3l7WMhs
**Enquiries:** should be addressed to **gosztola@mit.edu**

**Overview:**
Neuroscience and machine learning are at the cusp of a transformative era. In neuroscience, we can now *record from tens of thousands of individual neurons in multiple brain regions* using the new-generation Neuropixels probes and calcium imaging. These large-scale recordings promise new insights into how the activity of neurons contributes to healthy and pathological cognitive function. However, to reveal this link, we need *new machine learning tools* to extract fine-grained information from these complex neural dynamical systems. The new understanding we will derive using these tools will *inspire new machine learning theories that deal with tasks more like the brain*.

**Project description:**
You will work on cutting-edge single-neuron recordings in mice and macaques to study how complex cognitive function is distributed across the brain, challenging the current anatomically compartmentalised viewpoint. You will develop state-of-the-art methods combining geometric deep learning and dynamical systems theory and make new contributions to neuroscience and AI.

**Opportunities:**
The project offers several opportunities for collaboration and developing transferrable skills.
• Build collaborations with neuroscientists and clinicians at the Medical University of Vienna on projects encompassing neuroimaging and brain-machine interfaces.
• Engage with international collaborator network at *EPFL, MIT and Imperial College London*.
• Present your work at international conferences in AI and neuroscience.

**Specific requirements:**
You are an ambitious student ready to tackle big questions at the interface of computational neuroscience and artificial intelligence. The ideal candidate will have a quantitative background (e.g., computer science, mathematics, computational neuroscience, physics or engineering) with strong mathematical and/or programming skills. Alternatively, you will have a background in neuroscience and demonstrate willingness to develop quantitative skills.

**Our commitment:**
We believe in the strength of diversity and inclusivity. We thus encourage applications from candidates of all backgrounds, especially those from underrepresented groups.