

Open PhD Student Position

Plasticity and Learning in Recurrent Spiking Neural Networks

Triesch Lab, Frankfurt am Main, Germany

We solicit applications for a PhD student position in my lab (<http://fias.uni-frankfurt.de/~triesch/>) at the Frankfurt Institute for Advanced Studies (FIAS) to study plasticity and learning in recurrent spiking neural networks.

The PhD project will address how learning induces connectome changes that implement the formation of a synaptic memory trace in cortical networks and how such a distributed memory trace becomes robust against alterations of individual synaptic connections in the presence of constant synaptic turnover. In particular, we will develop computational models of the dynamics of the excitatory and inhibitory connectome in the mouse cortex during learning to explain learning dynamics in terms of fundamental underlying plasticity mechanisms and characterize the conditions for the formation of lasting memories. The research will be performed in close collaboration with the labs of Simon Rumpel (University of Mainz, experimental collaborator) and Matthias Kaschube (FIAS, Frankfurt, theoretical collaborator) and Jürgen Jost (MPI for Mathematics in the Sciences, Leipzig, theoretical collaborator). The project is embedded in Germany's priority program "Computational Connectomics" (<https://spp2041.de>).

We are seeking an outstanding and highly motivated PhD student for this project. Applicants should have obtained a Master Degree in Computational Neuroscience or a related field (Physics, Computer Science, Mathematics, Engineering, etc.). The ideal candidate will have excellent programming and analytic skills, experience with spiking neural network simulations, and a broad knowledge of Computational Neuroscience and neural plasticity. A strong interest in collaborating with experimental labs is a plus.

The Frankfurt Institute for Advanced Studies (<https://fias.institute/en/>) is a research institution dedicated to fundamental theoretical research in various areas of science. The city of Frankfurt is the hub of one of the most vibrant metropolitan areas in Europe. It boasts a rich culture and arts community and repeatedly earns high rankings in worldwide surveys of quality of living. Most recently, Frankfurt achieved 7th place worldwide in a ranking by the Economist.

Funding is available initially for three years. Remuneration is according to the German E13 pay scale at 65% full time equivalent (FTE).

Applications should consist of a single pdf file. Please include a brief statement of research interests, CV, and contact information for at least two references. The position can be filled immediately. Applications will be accepted until August 1st. Upload your document using the application platform at: <https://pm.fias.science/projects/application>

Prof. Dr. Jochen Triesch, Johanna Quandt Chair for Theoretical Life Sciences
Frankfurt Institute for Advanced Studies, <http://fias.uni-frankfurt.de/~triesch/>



FIAS Frankfurt Institute
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