Nils Eckstein

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Github, Portfolio

EDUCATION

Ph.D. Information Technology & Electrical Engineering — Zürich, ZH, CH
ETH Zürich — 09.2016 - 05.2021

Visiting Scientist in Residence — Ashburn, VA, US
HHMI Janelia Research Campus — 09.2018 - 09.2020

Master of Science Physics — Zürich, ZH, CH
ETH Zürich — 09.2014 - 09.2016

Bachelor of Science Physics — Zürich, ZH, CH
ETH Zürich — 09.2011 - 09.2014

EXPERIENCE

AI4Life Resident
Novartis - AI Innovation Lab (07.2021 - current)
- Development of Deep Neural Network interpretability methods.

Ph.D. Research
Institute of Neuroinformatics (ETHZ) & Funke Lab (HHMI Janelia)
- Development of a novel computer vision algorithm for tracking of sub-cellular structures (Microtubules) in various electron microscopy datasets at scale, combining deep learning with discrete optimisation on graphs.
- Development of a method for neurotransmitter classification in the fruit fly brain from electron microscopy images alone.
- Development of a novel method for Deep Neural Network interpretability.
- Teaching assistant - Models of Computation (Matthew Cook, ETHZ).

MSc. Research
Institute of Neuroinformatics, ETHZ
- Combining echo state networks with Boltzmann machines to predict the next frames in simple videos of hand movements via self supervision.

Black hole astrophysics group, ETHZ
- Development of black hole accretion disk simulations for the prediction of Active Galactic Nuclei light curves.

PUBLICATIONS

Eckstein et al. - Neurotransmitter Classification from Electron Microscopy Images at Synaptic Sites in Drosophila. bioRxiv 2020.06.12.148775.

Eckstein et al. - Microtubule Tracking in Electron Microscopy Volumes. MICCAI 2020. Lecture Notes in Computer Science, vol 12265.

Eckstein et al. - Discriminative Attribution from Counterfactuals. ArXiv 2021.

Buhmann et al - Synaptic Partner Prediction from Point Annotations in Insect Brains. MICCAI 2018. Lecture Notes in Computer Science, vol 11071.

Heinrich et al. - Whole-cell organelle segmentation in volume electron microscopy. Nature 2021.

Li et al. - The connectome of the adult Drosophila mushroom body provides insights into function. eLife 2020.

Baker et al. - Neural Network Organization for Courtship Song Feature Detection in Drosophila. bioRxiv 2021.

AWARDS

MICCAI 2020 Young Scientist Award.