Jan Philipp Bauer

japhba.github.io

Education

Ph.D. student in computational neuroscience 10/2022–
Edmond and Lily Safra Center for the Brain Sciences, The Hebrew University of Jerusalem, Israel

Working on kernel descriptions of chaos in recurrent models of the brain.
Advisor: Dr. Jonathan Kadmon

M.Sc. in physics **GPA** 1.0/1.0, with distinction 2019–2022
RWTH Aachen University, Germany

Focussed coursework on Statistical Mechanics of Neural Networks, Theoretical Neuroscience, Deep Learning in Physics Research, Quantum Information, and Computational Physics

Master's thesis 09/2021–08/2022
Juelich Research Center, Germany

Analysis of computation in cortical networks by Gaussian process regression.
Advisors: Prof. Moritz Helias, Dr. Christian Keup (now EPFL Switzerland)

Summer school on Reinforcement Learning 06/2022
Vrije Universiteit Amsterdam

Bilateral graduate exchange program 09/2019–03/2020
The University of Tokyo

Focussed coursework on Tensor Networks and Universal Biology, which investigates stem cell differentiation and evolution by a mathematical, complex systems approach. Member of Japanese university choir "The White Rose"

B.Sc. in physics **GPA** 1.3/1.0, with distinction 10/2016–09/2019
RWTH Aachen University, Germany

Bachelor's thesis 03/2019–09/2019
Juelich Research Center, Germany

Description of unsupervised learning in Boltzmann machines via Feynman diagrams.
Advisors: Prof. Moritz Helias, Dr. Tobias Kuehn (now ENS Paris)

4x **teaching assistant** in theoretical physics and lab courses, mentoring 1^{st} to 10^{th} semester students

Professional experience

Research Internship 03/2021–06/2021
Bosch Center for Artificial Intelligence, Renningen, Germany

Co-developed and implemented architectural extensions of Bayesian version of the Neural Process model.

Honours

Scholarship fellow of the Konrad Adenauer Foundation (one of 13 academic scholarship institutions established by the Federal Ministry of Education and Research)	since 2016
Fellow of RWTH Aachen University's **Dean's List** of top 5% students	since 2019
Valedictorian in Abitur A-Levels	2016

Presentations

Poster **Discrete communication mediates effective regularization in chaotic recurrent networks**, COSYNE 2023, Montréal, Canada	03/2023
Random Matrix Theory for Machine Learning, Parallel Sessions of INM-6 Annual Retreat	05/2022
Inference with Graphical Models, Book Club of Institute for Neuroscience and Medicine, Juelich Research Center	10/2021
Proof-read and advised high school textbook together with teacher Dr. Bardo Diehl at didactics congress MNU Aachen in front of 40 participants *("Zentrale Experimente für das Abitur", Cornelsen 2017)*	04/2017

Students (Co-)Supervised

L. Schutzeichel, Master's thesis on theoretical modeling of stimulus transients in mouse Neuropixel recordings	2022–

Teaching Experience

Statistical Physics and Field Theory	summer 2022
Theory of Electromagnetism	winter 2022
Preparatory math course for computer scientists	10/2020
Theory of Thermodynamics	winter 2020
Introductory lab course for physicists	09/2018
Introduction to Theoretical Physics (1^{st} year B.Sc.)	winter 2018

Leadership and Outreach

Social commitment

Volunteer at the City of Aachen, supporting Egyptian family with homework and administrative tasks — 2017–2020

Co-organisation of "LernFair"-AI lessons, part of a project aimed at high school students during the pandemic — winter 2021

Full-time scholarship by the Konrad Adenauer Foundation — 2016–2022

Elected **spokesperson** of local group of 25 students — 2019–2020

Increased participation of students by bundling proposals for engaging and meaningful group activities, such as a volunteer week in kindergarten in socially deprived suburb of Aachen

Initiated and organized **4-day seminar on the scientific voice in democracies**, with invited speakers on the philosophy of science, politics, recent societal challenges, and science communication — 04/2022

Service to inform about cancellation of school lessons in the early morning before classes start — 2015

Development of mobile app to create a precise elevation map of Aachen by use of barometer data of phones, targeted at finding a least elevation bicycle route — 2016

Application of machine learning and Fourier decomposition to successfully remove chequered paper background from handwritten lecture notes — 2020

Software and Language Proficiency

Software

Python

Machine Learning frameworks PyTorch and JAX

3D computer graphics with Blender

Languages

German (native)

English (academic proficiency, daily usage)

French (good, DELF A2)

Japanese (good, weekly practice with Tandem partner)

Recreational Activities

Bicycle touring and medium distance running (olympic-distance triathlon in September 2022)

Singing in university choir (tenor voice)

References

Dr. Jonathan Kadmon, Ph.D. advisor, The Hebrew University of Jerusalem

Prof. Moritz Helias, M.Sc. thesis advisor, Juelich Research Center

Michael Volpp, research internship advisor, Bosch Center for Artificial Intelligence

Dr. Christian Keup, M.Sc. thesis advisor, EPFL Switzerland

Dr. Tobias Kuehn, B.Sc. thesis advisor, Ecole Normale Supérieure Paris

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