

Jan Philipp Bauer

🏠 japhba.github.io

EDUCATION

Ph.D. student in theoretical neuroscience 10/2022–10/2026

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

Research stay 11/2023–

Summerfield lab, University of Oxford, United Kingdom

Project on context curriculum learning with linear networks.

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)

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 1st to 10th 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

HUJI International PhD Talent Scholarship	since 2023
Springorum memorial coin for outstanding graduates	2022
Scholarship fellow of the Konrad Adenauer Foundation (one of 13 academic talent promoters established by the Federal Ministry of Education and Research)	2016-2022
Fellow of RWTH Aachen University's Dean's List of top 5% students	since 2019
Valedictorian in Abitur A-Levels	2016

PRESENTATIONS

Talk Can discrete neurons be useful? , ELSC Annual Retreat, Nahsholim, Israel	06/2023
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 (<i>"Zentrale Experimente für das Abitur"</i> , Cornelsen 2017)	04/2017

SCHOOLS & WORKSHOPS

12-day workshop "Analytical Connectionism" University College London, United Kingdom	09/2023
3-week summer school "Mathematical Methods in Computational Neuroscience" NTNU, Norway	07/2023
5-day workshop "Recent advances in understanding artificial and biological neural networks" Les Houches School of Physics, France	02/2023
5-day summer school "Reinforcement Learning" Vrije Universiteit Amsterdam	06/2022

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
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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
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Service to inform about cancellation of school lessons in the early morning before classes start	2015
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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
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Application of machine learning and Fourier decomposition to successfully remove chequered paper background from handwritten lecture notes	2020
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SOFTWARE AND LANGUAGE PROFICIENCY

Software

Python, JAX, PyTorch

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

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

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

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

Updated: January 31, 2024