Jonathan Geuter

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Personal Profile

PhD student in Applied Mathematics at Harvard. Passionate about machine learning, LLMs (particularly inference time algorithms and alignment), generative modeling (flow matching/diffusion models), and optimal transport. Kempner Graduate Fellow at the Kempner Institute for the Study of Natural & Artificial Intelligence at Harvard.

Education

Harvard University — *Cambridge, US*
PhD in Applied Mathematics — *Sep 2023 - May 2028 (exp.)*

- Supervised by Prof. David Alvarez-Melis, part of Harvard ML Foundations
- Working on optimal transport for machine learning, LLMs (inference-time algorithms and model alignment), and generative models
- Supported by a Kempner Graduate Fellowship

Harvard University — *Cambridge, US*
MSc in Computer Science — *Sep 2023 - May 2025*

MIT — *Cambridge, US*
Cross-Registered Student — *Sep 2023 - May 2025*

Technische Universität Berlin — *Berlin, Germany*
MSc in Mathematics — *Oct 2020 - Oct 2022*

University of California, Berkeley — *Berkeley, US*
UC Education Abroad Program — *Aug 2018 - May 2019*

Technische Universität Berlin — *Berlin, Germany*
BSc in Mathematics — *Oct 2016 - Sep 2020*

Work Experience

Harvard University — *Cambridge, US*
Teaching Assistant for *Computational Science and Engineering Capstone Project Class* — *Jan 2025 - May 2025*

Jina AI — *Berlin, Germany*
Machine Learning Intern — *May 2023 - Aug 2023*

- Trained state-of-the-art open source language embedding models [HuggingFace link]

Zuse Institute Berlin — *Berlin, Germany*
Research Assistant — *May 2021 - Nov 2022*

- Worked on a Julia package for the Frank-Wolfe algorithm and GNNs in the *Laboratory for Interactive Optimization and Learning*

Technische Universität Berlin — *Berlin, Germany*
Teaching Assistant for *Computer-Oriented Mathematics I and II* — *Oct 2017 - Aug 2018; Oct 2019 - Mar 2021*

Technische Universität Berlin — *Berlin, Germany*
Teaching Assistant for *Calculus I* and *Linear Algebra I* — *Aug 2020 - Oct 2020*

University of California, Berkeley — *Berkeley, US*
Research Intern — *Oct 2018 - Dec 2018*

Publications and Projects

Guided Speculative Inference for Efficient Test-Time Alignment of LLMs [link]
J. Geuter, Y. Mroueh, D. Alvarez-Melis. ***Spotlight***, *3rd Workshop for Efficient Systems for Foundation Models at ICML 2025*, Vancouver, Canada.

Entropy-Driven Pre-Tokenization for Byte-Pair Encoding [link]
Y. Hu, N. Liang, D. Zhao, J. Geuter, V. Reddy, C. Schmidt, C. Tanner. In *Proceedings of the Tokenization Workshop (TokShop) at ICML 2025*, Vancouver, Canada.

DDEQs: Distributional Deep Equilibrium Models through Wasserstein Gradient Flows [link]
J. Geuter, C. Bonet, A. Korba, D. Alvarez-Melis. In *Proceedings of the 28th International Conference on Artificial Intelligence and Statistics (AISTATS 2025)*, Phuket, Thailand.

Universal Neural Optimal Transport [link]
J. Geuter, G. Kornhardt, I. Tomasson, V. Laschos. In *Proceedings of the 42nd International Conference on Machine Learning (ICML 2025)*, Vancouver, Canada.

Jina Embeddings: A Novel Set of High-Performance Sentence Embedding Models [link]
M. Günther, L. Milliken, J. Geuter, G. Mastrapas, B. Wang, H. Xiao. In *Proceedings of the 3rd Workshop for Natural Language Processing Open Source Software at EMNLP (NLP-OSS 2023)*, pages 8-18, Singapore. Association for Computational Linguistics.

A Sinkhorn-NN Hybrid Algorithm for Optimal Transport - *Master's Thesis* *Berlin, Germany*
Technische Universität Berlin and Weierstrass Institute *May 2022 - Oct 2022*

FrankWolfe.jl, CINDy *Berlin, Germany*
Zuse Institute Berlin *May 2021 - Nov 2022*

- Contributed to a Julia package of the Frank-Wolfe algorithm, and a Python implementation of the CINDy algorithm

Nonlinear Korn Inequalities - *Bachelor's Thesis* *Berlin, Germany*
Technische Universität Berlin and Humboldt Universität zu Berlin *Jun 2020 - Sep 2020*

Skills

Programming Python (PyTorch, transformers, vLLM, NumPy, TensorFlow, JAX, scikit-learn, pandas, multiprocessing, distributed training, etc.), Julia
Miscellaneous Bash, LaTeX, Git

Achievements

2025 **Grant,** 2025 QuantCo ICML Travel Scholarship *US*
2025 **Grant,** Hudson River Trading ICML Scholar Award *US*
2025 **PhD Fellowship,** Kempner Institute Graduate Fellowship *Cambridge, US*
2021 **Scholarship,** *Deutschlandstipendium* for two semesters *Germany*
2020 **Scholarship,** *Deutschlandstipendium* for two semesters *Germany*
2018 **Grant,** for two semesters of full-time study granted by the University of California, Berkeley *Berkeley, US*

Service

Reviewer NeurIPS (2023), AISTATS (2024), ICML (2025)

Interests

Hobbies Biking, hiking, gym, bouldering, tennis, badminton, kite surfing, skiing, writing, chess
Politics Engaged in the German Green Party; co-founder of European Horizons Chapter TU Berlin
Volunteering Founded a soup kitchen during my time at Berkeley; ran a math club for elementary school students for a few years

Languages

German Native proficiency
English Professional proficiency *TOEFL iBT: 118/120*
French Basic proficiency *certified level B1, 4 years in high school*
Mandarin Basic proficiency *5 years in high school*
Spanish Basic proficiency *two semesters at Berliner Volkshochschulen*
Italian Basic proficiency *one semester at UC Berkeley*