Maximilian Müller

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🌐 https://mueller-mp.github.io/ · 🐦 @mueller_mp · 📖 Google Scholar

Education

2021 – now **ELLIS PhD student in Machine Learning, University of Tübingen**
Focus on safe, robust and and reliable Machine Learning, Generalization and Optimization. Supervisors: Matthias Hein and Gergely Neu.

2018 – 2021 **M.Sc. Physics, LMU Munich ($\varnothing\, 1,2$)**
Master thesis at Max Planck Institute for Plasma Physics ($\varnothing\, 1,0$):
Uncertainty quantification with Bayesian Neural Nets for Machine Learning - based fluid simulations

2019 – 2020 **M.Sc. Data Science, Barcelona GSE ($\varnothing\, 9.6/10$)**
Highest final grade of my cohort
Thesis title: *Scalable Inference for Crossed Random Effects Models* ($\varnothing\, 9.5/10$).

2016 **Exchange Semester at Universidad Nacional de Colombia**
Supported by PROSA LMU scholarship.

2014 – 2018 **B.Sc. Physics, LMU Munich ($\varnothing\, 1,2$)**
Bachelor Thesis ($\varnothing\, 1,0$) at Max Planck Institute for Plasma Physics:
Simplified Calculation of Electron Cyclotron Current Drive Efficiency in Reactor-size Plasmas

2013 **High School - Abitur ($\varnothing\, 1,0$)**

Practical Experience

2023 - now **LLM and VLM Safety Researcher, OpenAI,** remote as indep. contractor
Various red teaming efforts to assess the risks and safety profile of OpenAI models and systems like GPT-4 and GPT-4o as part of the OpenAI Red Teaming Network.

2020 – 2021 **Research Assistant in Bayesian Statistics, Bocconi University,** remote
Development of scalable algorithms for Bayesian statistics.

2019 **Junior IT Consultant** TNG Technology Consulting, Munich
Developed and evaluated investing strategies, set up end-to-end architecture for IoT-showcase and developed recommendation system for internal learning platform.

2018 **Working Student in Quantum Optics** Toptica Photonics AG, Munich
Developed experiment for doppler-free spectroscopy of iodine.

Research Intern in Particle Physics University of Alberta, Canada
Bubble chamber simulations with Geant4 (C++ based program) for dark matter detection.

Selected Publications

Conference and Workshop Proceedings

(1) **M. Müller**, T. Vlaar, D. Rolnick, and M. Hein, "Normalization layers are all that sharpness-aware minimization needs," in *Advances in Neural Information Processing Systems*, 2023.

(2) J. Bitterwolf*, **M. Müller***, and M. Hein, "In or out? fixing imagenet out-of-distribution detection evaluation," in *Proceedings of the 40th International Conference on Machine Learning*, 2023.*equal contribution.

3 M. Andriushchenko, F. Croce, **M. Müller**, M. Hein, and N. Flammarion, "A modern look at the relation between sharpness and generalization," in *Proceedings of the 40th International Conference on Machine Learning*, 2023.

4 **M. Müller** and M. Hein, "Logex: Improved tail detection of extremely rare histopathology classes via guided diffusion," in *Medical Image Computing and Computer Assisted Intervention - ADSMI Workshop*, 2024.

5 **M. Müller** and M. Hein, "How to train your vit for ood detection," in *International Conference on Learning Representations - Workshop on Reliable and Responsible Foundation Models*, 2024.

Books and Chapters

1 N. Thuerey, P. Holl, **M. Müller**, P. Schnell, F. Trost, and K. Um, *Physics-based Deep Learning*. WWW, 2021. 🔗 URL: https://physicsbaseddeeplearning.org.

Journals

1 E. Poli, **M. Müller**, H. Zohm, and M. Kovari, "Fast evaluation of the current driven by electron cyclotron waves for reactor studies," *Physics of Plasmas*, 2018.

Skills

Languages	🔖	German (native), fluent in English and Spanish
Coding	🔖	Python (esp. Pytorch, TensorFlow, sklearn), R, SQL, LaTeX, AWS, …

Miscellaneous

Awards and Achievements

2021-now	🔖	**ELLIS PhD student**, Network for excellent young ML researchers in Europe
2020	🔖	**Master's Thesis selected for BGSE Voice Blog**
2013-2021	🔖	**Max Weber Program**, Scholarship for gifted students in Bavaria
2013	🔖	**TUM award for seminar thesis**, Visitor jury price for the best poster at students conference
	🔖	**Awards for outstanding achievements in Maths and Physics**, by German Physical Society and German Mathematical Society

Teaching

🔖 **Statistical Machine Learning**, TA

🔖 **Mathematics for Physics**, TA

🔖 **Experimental Physics for medical students**, lab supervisor

Community Service

🔖 Frequent reviewer for NeurIPS, ICML and ICLR