

MORITZ HAAS

📍 Tübingen, Germany — ☎ +49 176 43431847 — 📩 ha.moritz@gmail.com
🌐 Personal Website — ⚡ Google Scholar — ⚡ GitHub

RESEARCH INTERESTS

- Principled practical improvements in deep learning from first principles, Science of Scale, Tensor Program Theory, Deep Learning Theory, High-dimensional Statistics.
- ML in Science, ML in Climate Science, Graphs.

RESEARCH & WORK EXPERIENCE

Amazon AGI Foundations

Applied Scientist II

Tübingen, DE

August 2025 – Present

- Focused on the science of scale, foundation model pretraining, and continual learning.

Amazon Research and Development Center

Applied Scientist Intern, AGI Foundations

Tübingen, DE

Nov 2023 – Apr 2024

EDUCATION

Ph.D. in Computer Science

University of Tübingen, International Max Planck Research School for Intelligent Systems

Tübingen, DE

May 2021 – July 2025

- **Advisor:** Prof. Ulrike von Luxburg (Theory of Machine Learning).
- **Main subjects:** Deep Learning Theory, Width scaling, Benign overfitting, ML in Climate Science.

M.Sc. in Mathematics

Universität Heidelberg (Grade: 1.1; 1.0 is best possible)

Heidelberg, DE

Apr 2019 – Dec 2020

- **Minor:** Scientific Computing.
- **Thesis:** Theoretical Properties of Wasserstein Generative Adversarial Networks.

B.Sc. in Mathematics

Universität Heidelberg (Grade: 1.2; 1.0 is best possible)

Heidelberg, DE

Oct 2014 – Apr 2019

- **Minor:** Physics. Includes Exchange Semester at Universitat de Barcelona.
- **Thesis:** Fréchet Analysis of Variance for Random Objects.

Abitur

Adolf-Reichwein-Schule (Grade: 1.1; 1.0 is best possible)

Neu-Anspach, DE

June 2014

Year Abroad

Youth For Understanding Exchange Program

Solymar, Uruguay

Aug 2011 – July 2012

SELECTED PUBLICATIONS

- [1] **M. Haas.** "How Width Scaling Affects Neural Networks: Generalization, Optimal Hyperparameters, Feature Learning and Beyond." **PhD Thesis, University of Tübingen.** [PDF]
- [2] **M. Haas**, S. Bordt, U. von Luxburg, L. C. Vankadara. "On the Surprising Effectiveness of Large Learning Rates under Standard Width Scaling." **NeurIPS 2025 (Spotlight).** [PDF]
- [3] **M. Haas**, J. Xu, V. Cevher, L. C. Vankadara. " μP^2 : Effective Sharpness Aware Minimization Requires Layerwise Perturbation Scaling." **NeurIPS 2024.** [PDF]
- [4] L. C. Vankadara*, J. Xu*, **M. Haas**, V. Cevher. "On Feature Learning in Structured State Space Models." **NeurIPS 2024.** [PDF]

- [5] **M. Haas***, D. Holzmüller*, U. von Luxburg, I. Steinwart. "Mind the Spikes: Benign Overfitting of Kernels and Neural Networks in Fixed Dimension." **NeurIPS 2023**. [\[PDF\]](#)
- [6] **M. Haas**, B. Goswami, U. von Luxburg. "Pitfalls of Climate Network Construction: A Statistical Perspective." **Journal of Climate**, 2023. [\[PDF\]](#)

SELECTED CONFERENCE PRESENTATIONS

- **Talk:** Beyond μP : Scaling Insights from Infinite-width Theory for Non-standard Architectures and Learning Paradigms @ "2nd Workshop on Learning Under Weakly Structured Information and Uncertainty in Machine Learning", Tübingen AI Center, 2025. [\[Website\]](#)
- **Talk:** Mind the spikes: Benign overfitting of kernels and neural networks @ Workshop "Overparametrization, Regularization, Identifiability and Uncertainty in Machine Learning", MFO Oberwolfach, 2025. [\[Website\]](#)
- **Poster:** Mind the spikes: Benign overfitting of kernels and neural networks in fixed dimension @ Workshop "Statistical Physics and Machine Learning back together again", IESC Cargese, 2023. [\[Website\]](#)
- **Poster:** Pitfalls of Climate Network Construction: A Statistical Perspective @ Conference "Machine Learning and Signal Processing on Graphs", CIRM Marseille, 2022. [\[Website\]](#)
- **Talk:** Spurious Behaviour in Networks from Spatio-temporal Data, EGU General Assembly Vienna, 2022. [\[Website\]](#)

TEACHING

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|---|---------------------------------------|
| University of Tübingen <i>Supervision of Bachelor and Master Students</i> | Tübingen, DE Jan 2022 – July 2025 |
| University of Tübingen <i>Lecture Coordinator, "Statistical Machine Learning"</i> [Website] | Tübingen, DE Apr 2022 – Oct 2022 |
| • The lecture was awarded the Faculty's Teaching Award . | |
| Universität Heidelberg <i>Teaching Assistant, "Probability Theory 1"</i> | Heidelberg, DE Apr 2020 – Sep 2020 |
| Universität Heidelberg <i>Teaching Assistant, "Introduction to Probability Theory"</i> | Heidelberg, DE Apr 2018 – Sep 2018 |
| Universität Heidelberg <i>Teaching Assistant, "Analysis 1"</i> | Heidelberg, DE Oct 2016 – Mar 2017 |

SERVICE & AWARDS

- **Reviewer:** Top Reviewer NeurIPS 2024, Notable Reviewer ICLR 2025, ICML, Biometrika.
- **Fellowships:** Exchange Semester Scholarship by the "Baden-Württemberg Stiftung" (Barcelona).

TECHNICAL SKILLS

- **Programming & Tools:** Python, R, C++, Git, L^AT_EX.
- **Languages:** German (Native), English (Fluent), Spanish (Fluent).

ACTIVITIES

I enjoy reading, being in nature, and various kinds of sports, especially bouldering.