Jim Zhao

PhD in Machine Learning / Optimization | German citizenship
jim.zhao@unibas.ch | +41 76 204 54 98 | Basel, Switzerland
Website | Google Scholar | GitHub | LinkedIn

SUMMARY

Third year PhD researcher (Basel) in machine learning/optimization. Focus on second-order methods and efficient/low-precision training; Python/PyTorch; large-scale experimental design and analysis."

EDUCATION

PhD, Machine Learning / Optimization — University of Basel Feb 2023–present
Supervisor: Prof. Dr. Aurelien Lucchi

M.Sc. Electrical Engineering — Technical Univeristy of Munich Mar 2020– Nov 2022
GPA: 5.93/6.0, Top 1%, Focus: signal processing, biomedical imaging.

B.Sc. Electrical Engineering — Technical Univeristy of Munich Oct 2016–Feb 2020
GPA: 5.93/6.0, Top 1%

SELECTED PUBLICATIONS

Zhao, J.*, Singh, SP.*, Lucchi, A. "Theoretical characterization of Gauss-Newton conditioning in Neural networks", (*NeurIPS*, 2024). pdf | code
Zhao, J.*, Lucchi, A.*, Doikov, N.* "Cubic regularized subspace Newton for non-convex optimization" (*AISTATS*, 2025) (**Oral**, Top 2%). pdf | code

EXPERIENCE

PhD Researcher, University of Basel — Feb 2023-present

- First-authored two top-tier publications (NeurIPS, AISTATS Oral); maintained public code repos (PyTorch) and reproduction scripts.
- Proved global convergence guarantees for second-order stochastic subspace method for non-convex functions and validated on standard benchmarks vs. first-order baselines; code and configs available.
- Studied influence of neural networks components, deriving tight bounds on condition number of Gauss-Newton matrix in deep linear networks of arbitrary depth and width; validated results empirically.

Internship TRUMPF — Industrial image processing Apr-Sep 2019

- Supporting the development of a visual 3D measurement prototype (OpenCV/Python); co-authored a scientific paper on the prototype.

SKILLS

Programming: Python, PyTorch, NumPy, Pandas, SciPy, Matlab, C++ (working)
ML/DS: Optimization (first/second-order), quantization, experiment design at scale, reproducibility
MLOps: Git, unit testing, experiment tracking (W&B/Hydra), data versioning
Systems: Linux, HPC/SLURM; basic profiling (torch.profiler)
Languages: German: native, Chinese: native, English: C1 (fluent), French: B1

AWARDS

AISTATS 2025 Oral (Top 2%) | German Academic Scholarship Foundation (2019-2022)
1st prize, 1st round of German nationwide mathematics competition (2016)