

Felix Koehler


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PhD candidate at TUM specializing in deep learning for physical simulations, with publications at NeurIPS and ICLR. Expertise in adjoint methods, numerical simulators, fluid/solid mechanics and neural emulators. Creator of the largest  [SciML YouTube channel](#) with >30k subs.

Experience

Technical University of Munich

PhD Student in Computer Science

September 2022 - August 2026 (expected)

supervised by [Nils Thuerey](#)

- Coordinated annual lecture in *GamePhysics* (applied numerical methods + mechanical modeling) for >200 students.
- Supervised multiple students, e.g., [Unrolled vs. Implicit Autodiff for Linear System Solves](#) by Kanishk Bhatia.
- Instructed a lecture on *Autodiff and Adjoints in Differentiable Physics* for our *Physics-Based DL* master course ([Recording](#), [Slides](#)).

Meta Reality Labs

Research Scientist Intern

June 2025 - October 2025

supervised by [Ryan Goldade](#)

- Developed Graph Neural Network emulators to accelerate 3D softbody physics-based simulation for contact and collision.

Siemens Corporate Technology

Research Student

March 2020 - April 2022

supervised by [Dirk Hartmann](#)

- Researched explainable & efficient explicit approximations to model predictive control strategies with patent filed ([US20240176310](#)).

Volkswagen

Research Intern

October 2018 - March 2019

- Enhanced topology optimization with adjoint-based sensitivities for up to 40% weight reduction; results presented at 13th WCSMO ([Paper](#)).

Publications

Neural Emulator Superiority: When Machine Learning for PDEs Surpasses its Training Data. ([Website](#))

NeurIPS 2025

PRDP: Progressively Refined Differentiable Physics. (Shared First-Authorship). ([ArXiv](#), [Project Page](#))

ICLR 2025

APEBench: A Benchmark for Autoregressive Neural Emulators of PDEs. ([ArXiv](#), [Code](#), [Project Page](#))

NeurIPS 2024

Education

M.Sc. Computational Science & Engineering (CSE)

Technical University of Munich

October 2019 - April 2022

GPA: 1.2 (*German system: 1.0 (best) to 6.0 (worst)*), best 2%

- Relevant course work:
 - Numerical Analysis, Scientific Computing, Nonlinear Finite Element Method, Computational Plasticity.
 - ML for Graphs & Sequential Data, Uncertainty Quantification, Machine Learning, Probabilistic Machine Learning, Visualization.
 - Parallel Programming, High-Performance Computing, Parallel Numerics.
- Honors: Scholarship by *Studienstiftung des Deutschen Volkes* (most prestigious national scholarship program in Germany).
- Exchange semester at *KTH Stockholm* (August 2020 - January 2021).
- Activities: Electrodynamical Simulations of magnetic lift and drag with *ANSYS Maxwell* for [TUMHyperloop](#).

B.Sc. Mechanical Engineering

Technical University of Braunschweig

October 2015 - January 2019

GPA: 1.1 (*German system: 1.0 (best) to 6.0 (worst)*)

Skills

- Python: JAX, Tensorflow 2, PyTorch, Matplotlib, Pandas, Seaborn, Scikit-Learn, SciPy, NumPy, FEniCs
- C++: OpenMP, MPI, Eigen
- Other programming languages: Julia, bash, FORTRAN, MATLAB
- Tools/Platforms: Linux (Ubuntu & Arch), Git, Docker, OpenFoam, Paraview, ANSYS Maxwell, Siemens Amesim
- Spoken languages: English (professional, IELTS 8.5/9.0), German (native), French & Swedish (elementary)

Projects & Open Source

- Founder and producer of the [Machine Learning & Simulation YouTube channel](#); created more than 200 videos on AI for Science and adjacent topics (autodiff, optimization, probability, neural networks etc.), e.g., [FNO](#), [DeepONet](#), [Adjoint ODEs](#), [Variational Inference](#).
- [Exponax](#): I designed and maintain a JAX-based Fourier-spectral PDE solvers library based on ETDRK methods ([Docs](#)).
- Co-Organizer of [Differentiable Systems and SciML Workshop](#) at EurIPS 2025.