

EDUCATION

- 10/2026 – 09/2030 **PhD Machine Learning** TUM & ETH & Helmholtz AI
ELLIS joint supervision by ↗ Prof. Niki Kilbertus (TUM) and ↗ Prof. Andreas Krause (ETH)
- 10/2023 – 07/2026 **MSc Informatics** Technical University of Munich (TUM), DE
Final grade: **1,0** (best possible) ★ top 2% in cohort
 - Exchange term at UNSW Sydney in second half of 2024
 - Thesis: *Sample-Efficient Reinforcement Learning under Sparse Dynamics*
 - Courses: *Machine Learning, Statistical Foundations of Learning, Causality, Reinforcement Learning and Approximate Dynamic Programming, Advanced Deep Learning for Robotics, Computer Vision III, Algorithmic Game Theory, Computational Social Choice, Advanced Algorithms*
- 10/2022 – 06/2023 **MSc Mathematical Sciences** University of Oxford, UK
Final grade: **Distinction** (best possible) ★ rank 4 of 45 in cohort
 - Thesis: *Flood Forecasting with Graph Neural Networks*
 - Courses: *Advanced Statistical Machine Learning, Algorithmic Foundations of Learning, Numerical Linear Algebra, Continuous Optimisation, Theories of Deep Learning, Geometric Deep Learning*
- 10/2018 – 03/2022 **BSc Computer Science, BSc Mathematics** Universität Passau, DE
Final grade: **1,0** (best possible) ★ top 1% across cohorts 2003 to 2022
- 08/2010 – 06/2018 **High School Diploma ("Abitur")** Apian-Gymnasium Ingolstadt, DE
Final grade: **1,0** (best possible) ★ rank 1 of 162 in cohort

PUBLICATIONS

- 2024 **ICML Conference Paper** International Conference on Machine Learning (ICML)
Nikolas Kirschstein and Yixuan Sun. 2024. *The merit of river network topology for neural flood forecasting*. In Proceedings of the 41st International Conference on Machine Learning (ICML'24), Vol. 235. JMLR.org, Article 990, 24713–24725. ↗ <https://dl.acm.org/doi/10.5555/3692070.3693060>
- 2022 **ECML PKDD Conference Paper** European Conference on ML (ECML PKDD)
Sahib Julka, Nikolas Kirschstein, Michael Granitzer, Alexander Lavrukhin, and Ute Amerstorfer. 2022. *Deep Active Learning for Detection of Mercury's Bow Shock and Magnetopause Crossings*. In Machine Learning and Knowledge Discovery in Databases: European Conference, ECML PKDD 2022, Proceedings, Part IV. ↗ https://doi.org/10.1007/978-3-031-26412-2_28

AWARDS & HONOURS

- 01/2023 **Faculty Award** University of Passau, Germany
Award for the best bachelor's degree in cohort with 200€ prize money
- 05/2022 **DAAD Fellowship** German Academic Exchange Service (DAAD)
Substantial funding for my studies at Oxford (28250€ in total) due to academic merit
- 11/2020 **Studienstiftung Scholarship** Studienstiftung des deutschen Volkes
Monthly 300€ stipend plus abroad funding for "young people with outstanding talents who can be expected to make an exceptional contribution to society." ↗ [Website](#)
- 10/2018 **Max Weber Programme** Bavarian State Ministry of Science and the Arts
Monthly 215€ stipend plus earmarked grants for talented students in tertiary education
- 11/2022 **Joan Protheroe Scholarship** University of Oxford, UK
Recognition of musical talent with £100 honorarium and weekly singing lessons

WORK EXPERIENCE

- 03/2025 – 03/2026 **Research Assistant** Technical University of Munich (TUM), DE
Independently devising advanced geometric deep learning methods for improving ML-based interatomic potentials for computational chemistry (group of Prof. Günnemann)
- 06/2023 – 09/2023 **Software Engineering Intern** Google, Mountain View & New York, US
Prototyped generative AI methods for automatic video synthesis (Python); presented my prototype at internal event "Beakers & Breakthroughs" with high visibility (Google Labs Research Director Steve Seitz and Vice President Josh Woodward)
- 05/2022 – 08/2022 **Software Engineering Intern** Google, San Francisco, US
Developed a novel addressing scheme for Google Cloud Tags (Java)

RESEARCH PROJECTS

- 2026 **Sample-efficient Reinforcement Learning** TU Munich, DE
Sample-efficient Reinforcement Learning under Sparse Dynamics [[↗ Thesis](#)] [[↗ GitHub](#)]
- 2025 **Safe Reinforcement Learning** TU Munich, DE
A Multi-objective Approach to Safe Reinforcement Learning for Smart Grids [[↗ Report](#)] [[↗ GitHub](#)]
- 2024 **Reinforcement Learning & Robotics** TU Munich, DE
Factory Manipulation with Cooperative Multi-Agent Reinforcement Learning [[↗ Report](#)] [[↗ GitHub](#)]
- 2024 **Game Theory & Reinforcement Learning** UNSW Sydney, AU
Game-Theoretic Multi-Agent Reinforcement Learning [[↗ Essay](#)]
- 2024 **Transformers & ODEs** TU Munich, DE
How Transformers Speak: An Interacting Multi-Particle System Perspective [[↗ Report](#)] [[↗ GitHub](#)]
- 2023 **Geometric Deep Learning** University of Oxford, UK
Flood Forecasting with Graph Neural Networks [[↗ Thesis](#)] [[↗ GitHub](#)]
- 2022 **Computer Vision & Probabilistic Modelling** University of Oxford, UK
Noise Schedules for Diffusion Probabilistic Models [[↗ Report](#)] [[↗ GitHub](#)]

TEACHING EXPERIENCE

- 04/2025 – 09/2025 **Mathematics Tutor** Technical University of Munich, DE
 Taught two 2-hour weekly tutorial sessions for *IN0018 Discrete Probability Theory*
- 04/2020 – 02/2021 **Teaching Assistant** Universität Passau, DE
 Undergrad courses *5200 Algorithms and Data Structures*, *5306 Theoretical Computer Science*

VOLUNTEERING

- 07/2025 – 06/2026 **Scholar Representative** Studienstiftung München, DE
 Elected to represent ~1000 regional fellows by directing a buddy programme, coordinating with the scholarship administration, and organising events like the [↗ centenary concert](#)
- 04/2020 – 04/2022 **Student Representative** FSinfo Student Council, Universität Passau, DE
 • Represented the student body as full voting member in two professorship appointment committees (*AI Engineering* and *Discrete Mathematics*, from Bavarian Hightech Agenda)
 • Directed the personal mentoring programme for freshers three times
 • Led a successful task force for resolving admin and didactic issues of a lab course
- 10/2020 – 09/2021 **Conference Organiser** Universität Passau, DE
 Organised and co-moderated the [↗ student conference](#) within the 2021 joint meeting of the German and Austrian Mathematical societies DMV and ÖMG in Passau
- 04/2020 – 03/2022 **Technology Appointee** Student Choir of Passau, DE
 • Developed, administered, and maintained the choir website, server, and mailing list
 • Built a digital tracking system with QR codes for pandemic-proof choir rehearsals
 • Cut, mixed, and published recordings of the semester closing concerts
- 03/2020 – 07/2020 **On-call Social Volunteer** Bavarian Red Cross (BRK), Ingolstadt, DE
 Completed errands like shopping for quarantined and medical high-risk individuals during the first COVID-19 wave without compensation, having full responsibility for BRK's VW T6

SKILLS

PROGRAMMING	Python, Java, C/C++, Haskell, Prolog, MATLAB, SQL
MACHINE LEARNING	JAX (+ optax, flax, equinox), PyTorch, e3nn, Stable Baselines 3, MuJoCo, NumPy, SciPy, Pandas, Jupyter, Huggingface, Git, WandB, Slurm
RESEARCH	L ^A T _E X, Overleaf, Zotero, arXiv, ideation, teamwork, poster presentation
MATHEMATICS	optimisation, learning theory, Bayesian inference, causal inference, Markov processes, game theory
LANGUAGES	English (C2), German (native), Italian (B2), Spanish (A2), French (A2)