

Ata Keskin

Formal verification, quantitative modelling and production software. M.Sc. candidate in Informatics and Mathematics at TU Munich; co-founder of Venued.

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EXPERIENCE

Co-founder and lead engineer · Venued, Munich 2025 – present

- AI event agency for corporate, private and public events: describe an event and the platform plans it, books the venue and professionals, takes payment, sells tickets and runs the door. Designed and built most of the system.
- Two Flutter apps (guests; Studio for organisers and door staff), a Next.js web app and Studio dashboard, and a Firebase Cloud Functions back end.
- Graph neural network recommender (HeteroSAGE with pretrained text embeddings) for personalised event discovery.
- AI broker agents that turn a plain-language idea into an event plan and draft supplier emails, with a deterministic evidence gate between model output and recorded prices.
- Event-ingestion service: a fleet of browser-driving workers that harvests external listings into a human review cockpit before anything is published.

Working Student, Quantitative Research · Volue Trading Advisory, Munich 03/2024 – 09/2026

- Developed statistical models, from tree-based methods to Gaussian processes, to forecast intraday price movements in EEX auctions and inform pricing strategy.
- Built a Next.js dashboard that visualises model metrics and predictive performance in real time.

Undergraduate Research Assistant · Technical University of Munich 08/2022 – 02/2024

- Formalised measure-theoretic probability in Isabelle/HOL for the group of Prof. Tobias Nipkow, supervised by Katharina Kreuzer, in support of a proof that the Shortest Vector Problem is NP-hard under randomised reductions.
- Results: the Sauer–Shelah lemma, the Eudoxus construction of the reals, martingales and conditional expectation on Banach spaces, and Doob’s upcrossing inequality with martingale convergence (see Formal proofs).

Working Student, MLOps · Infineon Technologies, Munich 03/2022 – 07/2022

- Worked with the AI & Cloud Services team on a speech recognition model implemented mainly in TensorFlow.

Student Tutor · Technical University of Munich 09/2020 – 03/2022

- Weekly tutorials for Functional Programming and Verification (OCaml), Discrete Structures, and Introduction to Computer Science (Java). Mentored students and corrected homework and exams.

FORMAL PROOFS AND PUBLICATIONS

Comparative Evaluation of SDP, SOCP, and QC Convex Relaxations for Large-Scale Market-Based AC Optimal Power Flow. arXiv:2602.14136 [math.OC] Feb 2026

Doob’s Upcrossing Inequality and Martingale Convergence Theorem. Archive of Formal Proofs, Isabelle/HOL Feb 2024

Martingales. Archive of Formal Proofs; also arXiv:2311.06188 Nov 2023

Eudoxus Reals. Archive of Formal Proofs Oct 2023

Sauer–Shelah Lemma. Archive of Formal Proofs Nov 2022

RESEARCH PROJECTS

Master's thesis: Nyström guarantees for self-supervised learning · TU Munich due 11/2026

- Excess-loss bound for Nyström-approximated top-eigenspace learning of signed operators, with a single function acting as both selection rule and loss weight.
- One theorem covers Barlow Twins, SimCLR, VICReg and signed kernel PCA, and recovers the classical rate under polynomial eigenvalue decay.

Guided research: ACOPF convex relaxations · Group of Prof. Martin Bichler, TU Munich 03/2025 – 10/2025

- Built a Python and MOSEK framework benchmarking SDP (full and chordal), SOCP and QC relaxations of large-scale AC optimal power flow.
- Implemented chordal decomposition and Sobol-sequence bound tightening to study the tightness versus runtime trade-off; published as the arXiv paper above.

Interdisciplinary project: Factor Engine · Group of Prof. Sebastian Müller, TU Munich 11/2024 – 05/2025

- Python library on Polars computing the 11 Stambaugh–Yuan mispricing variables from large datasets, with a decorator-driven API for custom factors.
- Validated all outputs against a reference Stata implementation; published as the arXiv paper above.

EDUCATION

M.Sc. Mathematics · Technical University of Munich 04/2025 – present

M.Sc. Informatics · Technical University of Munich 09/2023 – expected 2026

B.Sc. Mathematics · Technical University of Munich 09/2019 – 04/2025

B.Sc. Informatics · Technical University of Munich 09/2019 – 09/2023

Thesis: On the Formalization of Martingales (Isabelle/HOL).

SKILLS

Formal methods	Isabelle/HOL, measure theory and probability, proof engineering
Quant and ML	Python, Polars, MOSEK, Gaussian processes, tree-based models, TensorFlow, kernel methods
Software	TypeScript, Next.js, Flutter and Dart, Firebase, LLM agent systems, OCaml, Java
Languages	Turkish (native), English (fluent, C2), German (fluent, C2), French (B1), Chinese (A1)