Zifan Lyu

PhD student in Computer Science, ETH Zurich

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Education

Jan 2026 – present **ETH Zurich**, PhD in Computer Science

- Research on efficient evaluation of large language models (LLMs).
- First-author ICML 2026 paper in the first year.
- Two further projects to be submitted in early 2027.

Sept 2021 – Feb 2025 **ETH Zurich**, MSc in Statistics

- Overall grade 5.85/6.00, with distinction; over 150 ECTS completed (90 required).
- Coursework: Guarantees for Machine Learning, Probabilistic Artificial Intelligence, Deep Learning in Scientific Computing, Probability Theory, Fundamentals of Mathematical Statistics, Functional Analysis I–II, Numerical Solution of Stochastic Ordinary Differential Equations.

Sept 2018 – July 2021 **London School of Economics (LSE)**, BSc in Mathematics, Statistics and Business

- First Class Honours.
- Coursework: Stochastic Processes, Algorithms and Programming.

Publications

2026 **Cutting LLM Evaluation Costs with SySRs: A Bandit Algorithm that Provably Exploits Model Similarity** (arXiv:2606.07726)

Successive Rejects with paired comparisons: hyperparameter-free, guarantees improve with model similarity; lower average error rate than all baselines on 15 benchmarks, and lower worst-case budget to identify the best model.
Zifan Lyu, Chahine Nejma, Tobias Wegel, Fanny Yang, Florian E. Dorner · International Conference on Machine Learning (ICML 2026)
Code: best-model and top-k identification on 15 benchmarks, 39–450 LLMs each.

2026 **Checkable NTK Positivity and Finite-Width Gradient Descent for Scalar- and Vector-Valued PINNs with Strong-Form, Weak-Form, and Nonlocal Linear Constraints** (arXiv:2610.04357)
Zifan Lyu · Under review at the International Conference on Learning Representations (ICLR 2027)
Code: gradients tested against PyTorch autograd.

Research Experience

June 2025 – Dec 2025 **Research Assistant**, ETH Zurich

- Developed SySRs, a hyperparameter-free bandit algorithm that finds the best LLM with fewer evaluations by exploiting similarity between models (ICML 2026).

Feb 2024 – Nov 2024 **Research on physics-informed neural networks (MSc)**, ETH Zurich

- Combining computer vision with physics-informed neural networks to estimate the underlying fluid dynamics (manuscript in preparation).
- Checkable positive-definiteness criteria for the limiting neural tangent kernel of PINNs with linear constraints, and high-probability guarantees for finite-width gradient descent (arXiv:2610.04357).

Other Experience

Sept 2023 – Dec 2023 **Teaching Assistant, Probability Theory (401-3601-00L)**, ETH Zurich

- Weekly exercise sessions and grading for Prof. Igor Kortchemski's graduate course.

Sept 2019 – June 2020 **Head of Diversity and Inclusion**, LSESU Business & Investment Group

- LSE's largest student society: organised diversity and inclusion events on campus and liaised with employers alongside its Women's Advancement Division.

Oct 2019 – June 2020 **Peer Supporter**, London School of Economics (LSE)

- Confidential peer support for students facing academic stress, peer pressure and interpersonal difficulties; trained in active listening, crisis intervention and boundary-setting under professional supervision.

Skills and Languages

Programming: Python, R, MATLAB, C++

Tools: PyTorch, Git, Slurm (HPC)

Languages: English and Mandarin (bilingual), German (B1), Japanese (elementary)