

YIFENG LIU(LEWIS)

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EDUCATION

Tsinghua University

Beijing, China

Bachelor in Computer Science (Yao Class)

Sept. 2020 – June 2024

- **GPA: 3.93/4.00 (Rank 12/76)**; admitted on basis of performance on national college admissions exam (5/113,900, science track) as well as 36th Chinese Physics Olympiad Finals (Gold Medal).
- Selected awards: **Outstanding Winner** of The Mathematical Contest in Modeling/Interdisciplinary Contest in Modeling 2022 (top 0.12% of 8,181 participants on Problem E); **Comprehensive Scholarship** of Tsinghua University in 2021, 2022 and 2023; Xiao Shutie Scholarship for Applied Mathematics; **Excellent graduate** of Tsinghua University and **outstanding graduate** of IIIS (10 out of 76)
- Selected to Tsinghua Xuetang Talents Program (Top 10% as well as outstanding performance in scientific contests) and Academic Research Promotion Plan for College Students of Tsinghua University.
- Visiting student to University of Washington.

University of California, Los Angeles

Los, Angeles, United States

Ph.D. in Computer Science

Sept. 2024 – Ongoing

- Researching in the field of optimization and architecture of Large Language Models.

PUBLICATIONS

1. Team K, Du A, Gao B, et al. Kimi k1. 5: Scaling reinforcement learning with llms[J]. arXiv preprint arXiv:2501.12599, 2025.
2. Zhang, Y., Liu, Y., Yuan, H., Qin, Z., Yuan, Y., Gu, Q., & Yao, A. C. C. (2025). Tensor Product Attention Is All You Need. *arXiv preprint arXiv:2501.06425*.
3. Yuan H, Liu Y, Wu S, et al. MARS: Unleashing the Power of Variance Reduction for Training Large Models[J]. arXiv preprint arXiv:2411.10438, 2024.
4. Tangqi Fang, Yifeng Liu, Addie Woicik, Minsi Lu, Anupama Jha, Xiao Wang, Gang Li, Borislav Hristov, Zixuan Liu, Hanwen Xu, William S Noble, Sheng Wang, Enhancing Hi-C contact matrices for loop detection with Capricorn: a multiview diffusion model, *Bioinformatics*, Volume 40, Issue Supplement_1, July 2024, Pages i471–i480, <https://doi.org/10.1093/bioinformatics/btae211>
5. Liu Y, Xu H, Fang T, et al. T-Rex: Text-assisted Retrosynthesis Prediction[J]. arXiv preprint arXiv:2401.14637, 2024.
6. X. Qian, K. Hu, J. Wang, Y. Liu, X. Pan, J. Cao, and M. Wang. 2022. *The VolcTrans System for WMT22 Multilingual Machine Translation Task*. In *Proceedings of the Seventh Conference on Machine Translation (WMT)*, pages 1068–1075, Abu Dhabi, United Arab Emirates (Hybrid). Association for Computational Linguistics.
7. Y. Liu, X. Zheng, P. Tian. *Forestry for Carbon Sequestration*[J]. UMAP Journal, 2022, 43(3).

RESEARCH EXPERIENCE

Tsinghua University (IIIS)

Beijing, China

Research Assistant to Professor Zhilin Yang

Feb. 2022 – Feb. 2023

CodeGeeX

- Developed a code generation model with more diverse functions than existing models, including code translation and explanation;
- Provided the idea of soft-score hierarchy for training, so as it would be more model-friendly in the beginning of the training procedure, and assisted in the collection of the high-quality training data;
- Outperformed the existing models including InCoder-6.7B and CodeGen-Multi-16B in terms of pass@k (k=1,10,100) on the HumanEval-X benchmark;
- Published in KDD 2023 paper: *CodeGeeX: A Pre-Trained Model for Code Generation with Multilingual Evaluations on HumanEval-X*.

University of Washington (Paul G. Allen School of Computer Science and Engineering & Department of Genome Sciences)

Seattle, USA

Research Assistant to Professor William Noble and Professor Sheng Wang

Feb. 2023 – Aug. 2023

Hi-C Resolution Enhancement

- Development of a new tool for Hi-C resolution enhancement which incorporates high-order chromatin features as additional views of the count matrix and leverages a diffusion probability model backbone as an iterative enhancement step;
- Provided the idea of the weighted average of input channels including original Hi-C matrix, o/e normalized data, TAD score and HiCCUPs score rather than different loss items to improve HiCCUPs score and MSE simultaneously;
- Outperformed existing models including HiCARN, HiCNN and HiCSR in cross-chromosome and cross-cell-line settings;
- Liu Y, Fang T, Woicik A, et al. Enhancing Hi-C contact matrices for loop detection with Capricorn: a multiview diffusion model[J]. Bioinformatics, 2024, 40(Supplement_1): i471-i480. **(Accepted by ISMB 2024)**

ByteDance & UCLA

ByteDance Seed Team & UCLA AI Lab

Beijing, China & Los Angeles, United States

June. 2024 – Ongoing

Variance Reduced Adaptive Gradient Algorithm

- Development of a new optimization architecture, MARS, integrating the variance reduction with adaptive gradient approaches;
- Outperforms existing optimization methods including AdamW and Muon for Large Language Models and Computer Vision tasks.
- Yuan H, Liu Y, Wu S, et al. MARS: Unleashing the Power of Variance Reduction for Training Large Models[J]. arXiv preprint arXiv:2411.10438, 2024.

SELECTED AWARDS AND HONORS

- Gold medal for the 36th Chinese Physics Olympiad Finals 2019
- Outstanding Winner of The Mathematical Contest in Modeling/Interdisciplinary Contest in Modeling (Top 0.12% of 8,181 participants on Problem E) 2022
- Comprehensive Scholarship of Tsinghua University (Top 20%) in 2021, 2022 and 2023 2021-2023
- Xiao Shutie Scholarship for Applied Mathematics 2022
- Tsinghua Xuetang Talents Program Scholarship (top 10% as well as outstanding performance in scientific contests) 2020-2023
- Excellent graduate of Tsinghua University 2024
- Outstanding graduate of IIIS, Tsinghua University 2024

WORK EXPERIENCE

ByteDance

Research Internship, AI Lab

Beijing, China

July 2022 – Sept. 2022

- Research and development of the Volcano Machine Translation system on Word Sense Deduction;
- One of the authors of WMT22 paper: “The VolcTrans System for WMT22 Multilingual Machine Translation Task”.

Moonshot AI (Also as the 3rd Project for Undergraduate Graduation)

Research Internship, Alignment Department

Beijing, China

Dec. 2023 – June 2024

- Research and development on the alignment of the Kimi Model model for the abilities in mathematics and composition.
- Research and development on the multi-model ability of Kimi Chat.
- Team K, Du A, Gao B, et al. Kimi k1. 5: Scaling reinforcement learning with llms[J]. arXiv preprint arXiv:2501.12599, 2025.

ZhenFund

Investment Internship

Beijing, China

June 2024 – Sept. 2024

- Research in the investment of AI start-ups following Yusen Dai (Managing Partner) and Wei Kuang (Investment Director), ranging from visual 2D/3D AI, robotics (embodied AI), AI coding agent, AI games to AI education, AI entertainment as well as advertisement platform;
- Lead in the research in the investment of AI Music market, and named as the best intern for August 2024.

ByteDance

Research Internship, Seed Team

Beijing, China

June 2024 – Aug. 2024

- Research in the optimizer and long-context performance of Doubao Large Language Model.
- Development of MARS optimizer for integrating variance reduction and adaptive learning methods.

ADDITIONAL INFORMATION

Additional Professional and Extracurricular Experiences

- Reviewer of RECOMB 2024.
- Monitor of Yao class organizing several class and grade activities and winning the A-level class of Tsinghua University, from June 2021 to June 2022.

Computer and Language Skills

- Programming Languages: C++, Python (PyTorch/Triton etc.), HTML5/CSS, MATLAB, Verilog.
- Languages Skills: Chinese (native), English, Japanese.