Liangchen Luo

Contact Information

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Professional Summary

Experienced researcher and engineer in LLMs and reasoning. Built agentic coding models to achieve SoTA and production-ready with high proficiency. Built robust infra for post-training and agentic RL.

Education

Peking University (PKU)
School of Earth and Space Science
B.Sc., in the Specialty of Geographical Information Science — 2014 – 2019

Experience

xAI
Member of Technical Staff — Feb 2025 – Present

Grok Code: leading contributor

- Initiated the coding model effort from scratch.
- Hill-climbed on SWE-Bench Verified from 0% to **70+**%.
- Built the SWE Agent RL infra to unblock end-to-end agentic RL training.
- **Infra**: training efficiency improvement by **10x**: tuned (1) load-balancing strategy; (2) KV-cache hitting; (3) sampling prefetching; (4) sandbox keep-alive and recovering strategy; and implemented (5) unified actors and metrics collection for training, inference and 3rd-party APIs.
- **Modeling**: studied the agentic training recipe to achieve SoTA: (1) propose partial-trace SFT to improve IF and exploration; (2) implement and tune the tool set (3) tune RL recipe: reward, number of rollouts, length extension, entropy constraints, tool-call counts, thinking length, testing behaviors, etc. (4) train on diverse tasks with rubrics reward for IDE usage.
- **Data**: (1) built the data synthesis and validation pipeline; (2) formulated PR data for code-specialized base model midtraining with the pretraining team.
- **Leadership**: Growed the team from 2 $\rightarrow$ 10+ and now serve as the uber TL for model infra and training.

Grok 3 Thinking: test-time compute effort

- Proposed two algorithms for test-time scaling: (1) hierarchical universal majority-voting; (2) tournaments with multi-Elo ranking.
- Grok 3 achieved SoTA at the time on AIME (**93**%) and LiveCodeBench (**79**%).
- Grok 4 achieved SoTA on HLE (**44%/50**% on full/text-only set) using the multi-Elo strategy.

Google DeepMind
Senior Research Scientist — Nov 2024 – Feb 2025
Research Engineer — May 2024 – Nov 2024

Gemini Thinking: core contributor

- Co-authored **Gemini 2.5** technical report.
- In the reasoning team of Gemini post-training pillar; tech-lead of the process supervision for reasoning effort.
- Developed OmegaPRM algorithm: fully automated the process supervision signal collection on mathematical tasks.

- Performed test-time scaling with MCTS-based strategy to scale performance on AIME without plateauing until 2K rollouts.

Google Research / **Cloud AI**
Research Engineer Mar 2023 – May 2024
Software Engineer Sep 2021 – Mar 2023
AI Resident, advised by Andrew Howard and Mark Sandler Oct 2019 – Jun 2021

LLM mathematical reasoning; alignment and post-training; open-ended text generation and self-critique; TPU infrastructure; large-scale model compression.

Publications

17. Accelerating Inference of Retrieval-Augmented Generation via Sparse Context Selection.
Yun Zhu, Jia-Chen Gu, Caitlin Sikora, Ho Ko, Yinxiao Liu, Chu-Cheng Lin, Lei Shu, **Liangchen Luo**, Lei Meng, Bang Liu, Jindong Chen..
In *Proceedings of the 13th International Conference on Learning Representations (ICLR)*. 2025.

16. Fusion-Eval: Integrating Evaluators with LLMs.
Lei Shu, Nevan Wichers, **Liangchen Luo**, Yun Zhu, Yinxiao Liu, Jindong Chen, Lei Meng.
In *Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP): Industry Track*. 2024.

15. Multi-Step Problem Solving Through a Verifier: An Empirical Analysis on Model-Induced Process Supervision.
Zihan Wang, Yunxuan Li, Yuexin Wu, **Liangchen Luo**, Le Hou, Hongkun Yu, Jingbo Shang.
In *Findings of the Association for Computational Linguistics: EMNLP*. 2024.

14. Towards an On-Device Agent for Text Rewriting.
Yun Zhu, Yinxiao Liu, Felix Stahlberg, Shankar Kumar, Yu-hui Chen, **Liangchen Luo**, Lei Shu, Renjie Liu, Jindong Chen, Lei Meng.
In *Findings of the Association for Computational Linguistics: NAACL*. 2024.

13. RewriteLM: An Instruction-Tuned Large Language Model for Text Rewriting.
Lei Shu, **Liangchen Luo**, Jayakumar Hoskere, Yun Zhu, Yinxiao Liu, Simon Tong, Jindong Chen, Lei Meng.
In *Proceedings of the 38th AAAI Conference on Artificial Intelligence (AAAI)*. 2024.

12. Adaptive Gradient Methods with Dynamic Bound of Learning Rate.
Liangchen Luo*, Yuanhao Xiong*, Yan Liu, Xu Sun.
In *Proceedings of the 7th International Conference on Learning Representations (ICLR)*. 2019.

11. Learning Personalized End-to-End Goal-Oriented Dialog.
Liangchen Luo, Wenhao Huang, Qi Zeng, Zaiqing Nie, Xu Sun.
In *Proceedings of the 33rd AAAI Conference on Artificial Intelligence (AAAI)*. 2019.

10. Text Assisted Insight Ranking Using Context-Aware Memory Network.
Qi Zeng*, **Liangchen Luo***, Wenhao Huang, Yang Tang.
In *Proceedings of the 33rd AAAI Conference on Artificial Intelligence (AAAI)*. 2019.

9. An Auto-Encoder Matching Model for Learning Utterance-Level Semantic Dependency in Dialogue Generation.
Liangchen Luo*, Jingjing Xu*, Junyang Lin, Qi Zeng, Xu Sun.
In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP)*. 2018.

Manuscripts

8. Gemini 2.5: Pushing the Frontier with Advanced Reasoning, Multimodality, Long Context, and Next Generation Agentic Capabilities.
Gemini Team, Google.
arXiv preprint arXiv:2507.06261. 2025.
7. Improve Mathematical Reasoning in Language Models by Automated Process Supervision.
Liangchen Luo*, Yinxiao Liu*, Rosanne Liu, Samrat Phatale, Harsh Lara, Yunxuan Li, Lei Shu, Yun Zhu, Lei Meng, Jiao Sun, Abhinav Rastogi.
arXiv preprint arXiv:2406.06592. 2024.
6. SiRA: Sparse Mixture of Low Rank Adaptation.
Yun Zhu, Nevan Wichers, Chu-Cheng Lin, Xinyi Wang, Tianlong Chen, Lei Shu, Han Lu, Canoee Liu, **Liangchen Luo**, Jindong Chen, Lei Meng.
arXiv preprint arXiv:2311.09179. 2023.
5. Critique Ability of Large Language Models.
Liangchen Luo, Zi Lin, Yinxiao Liu, Lei Shu, Yun Zhu, Jingbo Shang, Lei Meng.
arXiv preprint arXiv:2310.04815. 2023.
4. Bridging the Gap Between Object Detection and User Intent via Query-Modulation.
Marco Fornoni, Chaochao Yan, **Liangchen Luo**, Kimberly Wilber, Alex Stark, Yin Cui, Boqing Gong, Andrew Howard.
arXiv preprint arXiv:2106.10258. 2021.
3. Large-Scale Generative Data-Free Distillation.
Liangchen Luo, Mark Sandler, Zi Lin, Andrey Zhmoginov, Andrew Howard.
arXiv preprint arXiv:2012.05578. 2020.
2. Image Segmentation via Cellular Automata.
Mark Sandler, Andrey Zhmoginov, **Liangchen Luo**, Alexander Mordvintsev, Ettore Randazzo, Blaise Agúera y Arcas.
arXiv preprint arXiv:2008.04965. 2020.
1. MUSE: Parallel Multi-Scale Attention for Sequence to Sequence Learning.
Guangxiang Zhao, Xu Sun, Jingjing Xu, Zhiyuan Zhang, **Liangchen Luo**.
arXiv preprint arXiv:1911.09483. 2019.

Professional Service

- Program committee member, the AAAI Conference on Artificial Intelligence (AAAI). 2020.
- Program committee member, the Annual Meeting of the Association for Computational Linguistics (ACL). 2019.
- Program committee member, the Conference on Language Modeling (COLM). 2024, 2025.
- Program committee member, the Conference on Empirical Methods in Natural Language Processing (EMNLP). 2019.
- Program committee member, the International Conference on Learning Representations (ICLR). 2021, 2024, 2025.
- Program committee member, the International Conference on Machine Learning (ICML). 2023, 2024, 2025.
- Program committee member, the Conference on Neural Information Processing Systems (NeurIPS). 2023, 2024.