Liangchen Luo

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Research Interests

Large Language Models, Reasoning, Natural Language Processing, Learning Theory

Education

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

Experience

Google DeepMind
- *Senior Research Scientist*   Nov 2024 – Present
- *Research Engineer*   May 2024 – Nov 2024

Gemini core contributor (reasoning team of post-training pillar); Gemini Thinking core contributor (tech-lead of process supervision for reasoning); Project Astra core contributor (tool-use and reasoning).

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

16. 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.

15. 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.

14. 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.

13. 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.

12. 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.

11. 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.

10. 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.

9. 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.

8. 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

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.