

Qingfeng Lan

Curriculum Vitae

University of Alberta
Edmonton, Alberta, Canada

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🌐 [Personal Website](#)

🔗 [Google Scholar](#)

🌐 [Linkedin](#)

🌐 [Github](#)

Research Interest Enhancing reasoning of large language models with reinforcement learning (RL).
Improving RL efficiency by reducing forgetting and maintaining plasticity.
Understanding the inner workings of deep neural networks.

Education

20.09 - Present Doctor of Philosophy in Computing Science, **University of Alberta**, Canada.

Supervisor [A. Rupam Mahmood](#)

18.09 - 20.08 Master of Science in Computing Science, **University of Alberta**, Canada.

Thesis Predictive Representation Learning for Language Modeling. [\[Link\]](#)

Supervisor [Alona Fyshe](#)

14.09 - 18.07 Bachelor of Engineering in Computer Science and Technology, **University of Chinese Academy of Sciences**, China.

Thesis A Deep Top-K Relevance Matching Model for Ad-hoc Retrieval. [\[Link\]](#)

Advisor [Yanyan Lan](#) (thesis advisor), [Guojie Li](#) (tutor)

17.10 - 18.03 Visiting Non-Matriculated Programme, **University of Oxford**, England.

Tutor [Leslie Ann Goldberg](#)

Publications

*: Equal contribution

Conference and Journal Articles

Nature-2024 **Loss of Plasticity in Deep Continual Learning.**

Shibhansh Dohare, J. Fernando Hernandez-Garcia, **Qingfeng Lan**, Parash Rahman, A. Rupam Mahmood, Richard S. Sutton. *Nature*, 2024. **Article.** [\[Link\]](#)

RLC-2024 **Learning to Optimize for Reinforcement Learning.**

Qingfeng Lan, A. Rupam Mahmood, Shuicheng Yan, Zhongwen Xu. *Reinforcement Learning Conference*, 2024. **Oral.** [\[Link\]](#)

RLC-2024 **More Efficient Randomized Exploration for Reinforcement Learning via Approximate Sampling.**

Haque Ishfaq, Yixin Tan, Yu Yang, **Qingfeng Lan**, Jianfeng Lu, A. Rupam Mahmood, Doina Precup, Pan Xu. *Reinforcement Learning Conference*, 2024. **Oral.** [\[Link\]](#)

RLC-2024 **Weight Clipping for Deep Continual and Reinforcement Learning.**

Mohamed Elsayed, **Qingfeng Lan**, Clare Lyle, A. Rupam Mahmood. *Reinforcement Learning Conference*, 2024. **Oral.** [\[Link\]](#)

- ICLR-2024 **Provable and Practical: Efficient Exploration in Reinforcement Learning via Langevin Monte Carlo.**
Haque Ishfaq*, **Qingfeng Lan***, Pan Xu, A. Rupam Mahmood, Doina Precup, Anima Anandkumar, Kamyar Azizzadenesheli. *International Conference on Learning Representations, 2024. Poster.* [\[Link\]](#)
- TMLR-2023 **Memory-efficient Reinforcement Learning with Value-based Knowledge Consolidation.**
Qingfeng Lan, Yangchen Pan, Jun Luo, A. Rupam Mahmood. *Transactions on Machine Learning Research, 2023. CoLLAs certification.* [\[Link\]](#)
- AISTATS-2022 **Model-free Policy Learning with Reward Gradients.**
Qingfeng Lan, Samuele Tosatto, Homayoon Farrahi, A. Rupam Mahmood. *International Conference on Artificial Intelligence and Statistics, 2022. Poster.* [\[Link\]](#)
- ICLR-2020 **Maxmin Q-learning: Controlling the Estimation Bias of Q-learning.**
Qingfeng Lan, Yangchen Pan, Alona Fyshe, Martha White. *International Conference on Learning Representations, 2020. Poster.* [\[Link\]](#)
- CCIR-2018 **A Deep Top-K Relevance Matching Model for Ad-hoc Retrieval.**
Zhou Yang, **Qingfeng Lan**, Jiafeng Guo, Yixing Fan, Xiaofei Zhu, Yanyan Lan and Yue Wang, Xueqi Cheng. *China Conference on Information Retrieval, 2018. Best Paper Award Candidate.* [\[Link\]](#)
- [Workshop and Non-Refereed Articles](#)
- ICML-2023 **Elephant Neural Networks: Born to Be a Continual Learner.**
Qingfeng Lan, A. Rupam Mahmood. *ICML Workshop on High-dimensional Learning Dynamics, 2023. Poster.* [\[Link\]](#)
- EWRL-2023 **Overcoming Policy Collapse in Deep Reinforcement Learning.**
Shibhansh Dohare, **Qingfeng Lan**, A. Rupam Mahmood. *European Workshop on Reinforcement Learning, 2023. Poster.* [\[Link\]](#)

--- **Employment**

- 24.11 - Present Research Intern, **Huawei Noah's Ark Lab**, Edmonton, Canada.
Collaborator [Boxing Chen](#)
Project Enhancing reasoning and planning of large language models with reinforcement learning.
- 24.06 - 24.10 Research Intern, **Meta Reality Lab**, California, United States.
Collaborator [Rohan Chitnis](#), [Alborz Geramifard](#)
Project Improving Next-generation Wearables through Reinforcement Learning. [\[Link\]](#)
 - Built a real-time online reinforcement learning training pipeline from scratch.
 - Improved the cursor control policy of the wearables with reinforcement learning.
- 22.07 - 23.01 Research Intern, **Sea AI Lab**, Singapore.
Collaborator [Zhongwen Xu](#), [Shuicheng Yan](#)
Project Learning to Optimize for Reinforcement Learning. [\[Link\]](#)
 - Applied meta-learning to learn an optimizer for reinforcement learning tasks.
 - Proposed the first learned optimizer for reinforcement learning that is stable to train and generalizes to unseen tasks. Paper accepted at RLC 2024.

- 22.01 - 22.06 Research Intern, **Huawei Noah's Ark Lab**, Edmonton, Canada.
Collaborator [Yangchen Pan](#), [Jun Luo](#)
Project Memory-efficient Reinforcement Learning with Value-based Knowledge Consolidation. [\[Link\]](#)
- Demonstrated that catastrophic forgetting exists even in single-task reinforcement learning, resulting in low learning efficiency.
 - Reduced the replay buffer size significantly by mitigating forgetting with value-based knowledge consolidation. Paper accepted at TMLR.
- 17.07 - 18.04 Research Assistant, **Key Laboratory of Network Data Science and Technology, Chinese Academy of Sciences**, Beijing, China.
Collaborator [Yixing Fan](#), [Yanyan Lan](#), [Jiafeng Guo](#)
Project A Deep Top-K Relevance Matching Model for Ad-hoc Retrieval. [\[Link\]](#)
- Proposed a deep relevance matching model for ad-hoc retrieval problem by applying the top-k pooling and a term gating network.
 - Outperformed SOTA models on two representative benchmark datasets. Paper accepted at CCIR 2018.

Academic Services

- Reviewer JMLR 2020, NeurIPS 2022-2024, ICLR 2023-2024, AISTATS 2023, CoLLAs 2023-2024, ICML 2024, RLC 2024, RLC 2024 Workshop Deployable RL.

Open-Source Code

[Jaxplorer](#).

A Jax reinforcement learning framework for exploring new ideas.

[Optim4RL](#).

A Jax framework of learning to optimize for reinforcement learning.

[Explorer](#).

A PyTorch reinforcement learning framework for exploring new ideas.

[Gym Games](#).

A collection of Gymnasium compatible games for reinforcement learning.

[Loss of Plasticity](#).

The implementation of continual backpropagation which maintains network plasticity.

Awards & Honors

- 2023 Alberta Innovates Graduate Student Scholarship, CAD 31,000.
University of Alberta

Computer skills

- Language Python, Matlab, C
Framework Jax, PyTorch, Tensorflow