Qingfeng Lan

Curriculum Vitae

University of Alberta
Edmonton, Alberta, Canada
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https://lancelqf.github.io/

I'm a PhD student at the University of Alberta. I have broad interests in artificial intelligence, especially model-based learning and representation learning in reinforcement learning.

Education

2020 - Present **Doctor of Philosophy in Computing Science**, *University of Alberta*, Canada.
Advisor Rupam Mahmood

2018 - 2020 **Master of Science in Computing Science**, *University of Alberta*, Canada.
Advisor Alona Fyshe

2014 - 2018 **Bachelor of Engineering in Computer Science and Technology**, *University of Chinese Academy of Sciences*, China.
Advisors Yanyan Lan (thesis advisor), Guojie Li (tutor)

17.10 - 18.03 **Visiting Non-Matriculated Programme**, *University of Oxford*, England.
Tutor Leslie Ann Goldberg

Research

20.09 - 21.02 **Model-free Policy Learning with Reward Gradients**.
- Provided a theoretical framework that unifies several existing policy gradient methods based on the reparameterization estimator
- Introduced a novel strategy to compute the policy gradient that incorporates both the likelihood ratio and reparameterization estimators
- Developed the first model-free policy gradient method to utilize reward gradients — Reward Policy Gradient (RPG) algorithm, and showed that RPG outperforms Proximal Policy Optimization (PPO) on several continuous control tasks

19.06 - 20.06 **Predictive Representation Learning for Language Modeling**.
- Proposed Predictive Representation Learning (PRL) which explicitly constrains Long Short Term Memory networks (LSTMs) to encode specific predictions by general value functions
- Improved the convergence rate and data efficiency of two strong language modeling methods significantly

2019.09 - 12 **Reducing Selection Bias in Counterfactual Reasoning for Individual Treatment Effects Estimation**.
- Proposed a new graphical model which includes the latent variables of the observed features
- Explicitly removed selection bias by separating the learned representations of features into parts

2019.04 - 09 **Maxmin Q-learning: Controlling the Estimation Bias of Q-learning**.

- Highlighted that the effect of overestimation bias on learning efficiency is environment-dependent
- Proposed a new variant of Q-learning algorithm called Maxmin Q-learning which provides a parameter-tuning mechanism to flexibly control bias

2017.07 - 09 **A Deep Top-K Relevance Matching Model for Ad-hoc Retrieval**.

- Proposed a deep relevance matching model for ad-hoc retrieval problem
- Leveraged Top-K pooling to capture the details of interaction scores and applied term gating networks to control the contribution of each query term to the final matching score

Employment

2019 - Present **Research Assistant**, *Alberta Machine Intelligence Institute, University of Alberta*, Edmonton, Canada.

17.07 - 18.04 **Research Assistant**, *Key Laboratory of Network Data Science and Technology, Chinese Academy of Sciences*, Beijing, China.

Publications

Preprints

In Submission **Model-free Policy Learning with Reward Gradients**.
Qingfeng Lan, A. Rupam Mahmood.

In Submission **Predictive Representation Learning for Language Modeling**.
Qingfeng Lan, Luke Kumar, Martha White, Alona Fyshe.

Refereed Articles

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.*

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.**

Others

NeurIPS-2019 **Reducing Selection Bias in Counterfactual Reasoning for Individual Treatment Effects Estimation**.
Zichen Zhang, **Qingfeng Lan**, Lei Ding, Yue Wang, Negar Hassanpour, Russell Greiner. *NeurIPS Workshop on Causal Machine Learning, 2019.* **Poster Spotlight.**

Open-Source Code

Explorer.
A reinforcement learning frame based on Pytorch for exploring new ideas.

Gym Games.
A gym compatible version of various games for reinforcement learning.

Teaching Experience

Winter 2019 **Teaching Assistant**, *University of Alberta*, Edmonton, Canada.
CMPUT 175: Introduction to the Foundations of Computation II

Fall 2018 **Teaching Assistant**, *University of Alberta*, Edmonton, Canada.
CMPUT 174: Introduction to the Foundations of Computation I

Computer skills

Advanced Python, PyTorch

Intermediate Tensorflow, Keras, C/C++, Octave/MATLAB, Verilog

Basic Haskell