# Zhaolin Gao

| | |
|---|---|
| **Contact** | E-mail: zg292@cornell.edu<br>Website: `https://zhaolingao.github.io`<br>Mobile: 607-262-3916 |

**About**

I'm a second-year Computer Science Ph.D. student at Cornell University, where I am advised by Thorsten Joachims and Wen Sun. My research includes reinforcement learning, natural language processing, and recommendation systems. My work has been published at NeurIPS, CVPR, WWW, SIGIR, RecSys, and INFOCOM.

**Education**

**Cornell University** — Aug. 2023 ∼ *Present*
- Ph.D., Computer Science

**University of Toronto** — Sep. 2018 ∼ Jun. 2023
- B.A.Sc., Computer Engineering, Minor in Artificial Intelligence
- Overall GPA: 3.95/4.00 (93/100); Technical Course GPA: 4.00/4.00 (95/100)

**Research Experience**

**Graduate Student Researcher, Cornell University** — Aug. 2023 ∼ *Present*
- Advised by Prof. Thorsten Joachims and Prof. Wen Sun.
- Topics: Reinforcement Learning for Generative Models & Recommendation System
  - LangPTune: the first end-to-end training pipeline designed to enable LLMs to generate more effective user profiles for recommendation.
  - REFUEL: new RL policy optimization algorithm for multi-turn RLHF. The algorithm enables efficient optimization for a 8B size model in long conversations against a 70B model.
  - REBEL: new RL algorithm for generative model optimization which outperforms PPO / DPO on text and image generation.
  - Reviewer2: a large scale language model for peer-review generation. Created the first large scale review dataset with corresponding prompts.

**Machine Learning Intern, Layer 6 AI** — May 2021 ∼ Aug. 2022
- Advised by Dr. Maksims Volkovs.
- Topics: Collaborative Filtering & Natural Language Processing
  - Proposed Mixed-Centric Loss, a novel loss for collaborative filtering (CF) which first leverages mining to select the most informative pairs, followed by a weighing process to allocate more weight to harder examples. Experiments show that the loss can be applied to different types of CF models, leading to significant gains with each type. We achieve the new state-of-the-art results by applying our loss to the graph convolutional architecture.
  - Placed 2nd in RecSys Challenge 2022. Designed two novel pre-training tasks inspired by BERT for session-based recommendation systems. The model is able to generate accurate user and item representations and demonstrates strong performance on the dataset provided by Dressipi.

**Research Assistant, University of Toronto** — Nov. 2021 ∼ Jun. 2022
- Advised by Prof. Scott Sanner.
- Topics: Variational Autoencoder & Recommendation System
  - Proposed TD-VAE-CF, a novel methodology that diversifies recommendations in the targeted dimension while preserving relevance across orthogonal dimensions. Experiments show that TD-VAE-CF better preserves relevance of content to user preferences across a range of diversification levels while being more efficient in comparison to Maximum Marginal Relevance.

**Research Assistant, University of Toronto** May 2019 ∼ Sep. 2019
- Advised by Prof. Baochun Li.
- Topics: Graph Neural Networks & Few-Shot Learning
  - Developed Shoestring, a novel framework that incorporates metric learning into the paradigm of graph-based semi-supervised learning to solve the problem of few-shot learning. The model performs classification by clustering the unlabeled samples according to the learned semantic space constructed from a metric learning network. It achieves state-of-the-art performance for node classification and image classification in the low-data regime.
  - Developed Guardian, an end-to-end framework that learns latent factors in social trust with graph convolutional neural networks (GCNs). Guardian is designed to incorporate social network structures and trust relationships to estimate social trust between any two users. The model can speedup trust evaluation by up to 2,827 times with comparable accuracy, as compared to the state-of-the-art in the literature.

**Publications**  <u>**Z. Gao**</u>, W. Zhan, J. D. Chang, G. Swamy, K. Brantley, J. D. Lee and W. Sun, *Regressing the Relative Future: Efficient Policy Optimization for Multi-turn RLHF,* arXiv preprint arXiv:2410.04612, 2024.

<u>**Z. Gao**</u>, J. Zhou, Y. Dai and T. Joachims, *End-to-end Training for Recommendation with Language-based User Profiles,* in Workshop on Risks, Opportunities, and Evaluation of Generative Models in Recommender Systems at RecSys'24.

<u>**Z. Gao**</u>, J. D. Chang, W. Zhan, O. Oertell, G. Swamy, K. Brantley, T. Joachims, J. A. Bagnell, J. D. Lee and W. Sun, *REBEL: Reinforcement Learning via Regressing Relative Rewards,* in Proceedings of the Advances in Neural Information Processing Systems, 2024.

<u>**Z. Gao**</u>, K. Brantley and T. Joachims, *Reviewer2: Optimizing Review Generation Through Prompt Generation,* arXiv preprint arXiv:2402.10886, 2024.

Y. Lu, <u>**Z. Gao\***</u>, Z. Cheng*, J. Sun*, B. Brown, G. Yu, A. Wong, F. Pérez and M. Volkovs, *Session-based Recommendation with Transformer,* in Proceedings of the Recommender Systems Challenge 2022 (RecSys 2022), Seattle, USA, Sep. 18-23, 2022.

<u>**Z. Gao**</u>, T. Shen, Z. Mai, M. R. Bouadjenek, I. Waller, A. Anderson, R. Bodkin and S. Sanner, *Mitigating the Filter Bubble while Maintaining Relevance: Targeted Diversification with VAE-based Recommender Systems,* in Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2022), Madrid, Spain, July 11-15, 2022.

<u>**Z. Gao\***</u>, Z. Cheng*, F. Pérez, J. Sun and M. Volkovs, *MCL: Mixed-Centric Loss for Collaborative Filtering,* in the Proceedings of the ACM Web Conference 2022 (WWW 2022), April 25-29, 2022.

W. Lin, <u>**Z. Gao**</u> and B. Li, *Shoestring: Graph-Based Semi-Supervised Classification With Severely Limited Labeled Data,* in the Proceedings of the 2020 IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2020), pp. 4174-4182, Seattle, Washington, June 16-18, 2020.

W. Lin, <u>**Z. Gao**</u> and B. Li, *Guardian: Evaluating Trust in Online Social Networks with Graph Convolutional Networks,* in the Proceedings of IEEE INFOCOM, pp. 914-923, Virtual Conference, July 6-9, 2020.

**Competition**  **RecSys Challenge 2022**, 2nd place (56 teams) Mar. 2022 ∼ July 2022
- Designed two novel pre-training tasks inspired by BERT for session-based recommendation systems. The model is able to generate accurate user and item representations and demonstrates strong performance on the dataset provided by Dressipi.

| | | |
|---|---|---|
| | **2022 SAE Autodrive Challenge II**, 1st place (10 teams) | Aug. 2021 ∼ May 2022 |

- Developed ground place removal algorithm for 3d point cloud. The algorithm is implemented on the autonomous vehicle that is tested by completing tasks such as recognizing and obeying stop signs or arriving at a sequence of pre-determined address points.

**MakeUofT 2019**, 2nd place (55 teams)                                    Apr. 2019
- Built a device that can capture hand motion and execute corresponding commands based on the motion with Oculus Rift, Leap Motion, and Arduino.

| | | |
|---|---|---|
| **Honors and Awards** | **LinkedIn PhD Award** | 2024 |
| | **University Fellowship, Cornell University** | 2023 |
| | **W. S. Wilson Medal, University of Toronto** | 2023 |
| | **Dean's Honour List, University of Toronto** | 2018 ∼ 2023 |
| | **ECE Top Student Award, University of Toronto** | 2018 ∼ 2020 |
| | **The Wallberg Undergraduate Scholarship, University of Toronto** | 2018 ∼ 2020 |
| | **First Year Research Fellowship, University of Toronto** | 2019 |

**Academic Activity**

**Reviewer**
- ACM Web Conference 2025 (main conference reviewer, short paper track PC member, HCRS program committee)
- IEEE Transactions on Knowledge and Data Engineering 2024
- IEEE Access 2024
- ICML Workshop on Aligning Reinforcement Learning Experimentalists and Theorists 2024
- ICML Workshop on Models of Human Feedback for AI Alignment 2024
- ACM Transactions on Asian and Low-Resource Language Information Processing 2024
- ACM Transactions on Information Systems 2022

**Presentation**
- *"End-to-end Training for Recommendation with Language-based User Profiles"* at the 1st Workshop on Risks, Opportunities, and Evaluation of Generative Models in Recommender Systems
- *"Rebel: Reinforcement learning via regressing relative rewards"* at NeurIPS 2024, Reinforcement Learning Conference (RLC) Workshop on Reinforcement Learning Beyond Rewards, and CS 6789 Foundations of Reinforcement Learning
- *"Mitigating the Filter Bubble while Maintaining Relevance: Targeted Diversification with VAE-based Recommender Systems"* at the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval
- *"MCL: Mixed-Centric Loss for Collaborative Filtering"* at the ACM Web Conference 2022

**Other**      Part-time content creator with more than 50,000 followers and 10 million views on Bilibili, Douyin, and YouTube. Immature photographer, videographer, and editor.