

Zhaolin Gao

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- About** I am an undergraduate student at the University of Toronto and I am going to Cornell for my Ph.D.. My research includes collaborative filtering, information retrieval, recommendation diversification, and session-based recommendation.
- Education** **University of Toronto** Sep. 2018 ~ *Present*
 - B.A.Sc., Computer Engineering
 - Overall GPA: 3.95/4.00 (92.5/100); Technical Course GPA: 4.00/4.00 (94/100)
- Research Experience** **Intern, Layer 6, TD Bank Group** May 2021 ~ Aug. 2022
 - RecSys Team, advised by Dr. Maksims Volkovs.
 - Topics: Collaborative Filtering & Session-based Recommendation
 - Proposed Mixed-Centric cost function, a novel cost 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 cost 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 cost to the graph architecture.
 - Placed 2nd in RecSys Challenge 2022. More details in the Competition section.
- Research Assistant, D3M, University of Toronto** Nov. 2021 ~ Jun. 2022
 - Data-Driven Decision Making Lab (D3M), advised by Prof. Scott Sanner.
 - Topics: Recommendation Diversification
 - 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, iQua, University of Toronto** May 2019 ~ Sep. 2019
 - iQua Group, advised by Prof. Baochun Li.
 - Topics: Trust Evaluation
 - Developed Shoestring, a novel framework that incorporates similarity scoring into the paradigm of graph-based evaluation to solve the problem of few-shot evaluation. The model performs evaluation by clustering the unlabeled samples according to the semantic space constructed from a similarity scoring network. It achieves state-of-the-art performance for node evaluation and image evaluation in the low-data regime.
 - Developed Guardian, an end-to-end framework that constructs latent factors in social trust with graph models. 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** Y. Lu, **Z. Gao***, 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.
- Z. Gao**, 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.
- Z. Gao***, 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, **Z. Gao** 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, **Z. Gao** 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	2nd place (56 teams) RecSys Challenge 2022	Mar. 2022 ~ July 2022
	- Designed two novel tasks 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.	
	1st place (10 teams) 2022 SAE Autodrive Challenge II	Aug. 2021 ~ May 2022
	- Developed ground plane 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.	
	3rd place (80 teams) Travelling Salesman Contest	Jan. 2020 ~ Apr. 2020
Teaching Experience	- Developed an efficient path-searching algorithm with multiple destinations by utilizing 2-opt, 3-opt, dynamic programming, A*, and simulated annealing. The algorithm demonstrates strong performance in terms of traveling time of the generated path.	
	2nd place (55 teams) MakeUofT 2019	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.	
	Tutor, Introduction to Programming	Jan. 2020 ~ Apr. 2020
	- Taught an introductory programming course to a class of 15 students using C.	
Honors and Awards	Tutor, Electromagnetic Field	Sep. 2020 ~ Dec. 2020
	- Taught an introductory course on electric and magnetic fields to a class of 10 students.	
	Dean's Honour List	2019, 2020, 2021
	ECE Top Student Award	2019, 2020
	The Wallberg Undergraduate Scholarship	2019, 2020
Academic Activity	First Year Research Fellowship	2019
	Reviewer	
	• ACM Transactions on Information Systems 2022	
	Presentation	
	• “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	
Other	• “MCL: Mixed-Centric Loss for Collaborative Filtering” at the ACM Web Conference 2022	
	Part-time content creator with more than 50,000 followers and 10 million views on Bilibili, Douyin, and YouTube. Amateur photographer, videographer, and editor.	