

Haolun Wu

Ph.D. candidate, Computer Science
McGill University & MILA - Quebec AI Institute
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Research Interests

Information Retrieval · Recommender System · Fairness · Continual Learning · Bandit Algorithm

Academic Studies & Diplomas

2021-present **Ph.D. Computer Science**, *McGill University & MILA*, Montreal, Canada.

I am honored to work with:

[Xue \(Steve\) Liu](#) (Fellow of Canadian Academy of Engineering, Fellow of IEEE)

[Fernando Diaz](#) (Google Research Scientist, CIFAR AI Chair, MILA Core Industry Member)

[Laurent Charlin](#) (CIFAR AI Chair, MILA Core Academic Member)

Expected graduation data: Jun. 2025.

2019-2021 **M.Sc. Computer Science**, *McGill University & MILA*, Montreal, Canada.

Thesis title: Balancing Fairness in Multi-stakeholder Recommendation via Multi-Objective Optimization. [Published at ACM Transactions on Information Systems \(TOIS\)](#).

2018-2018 **International Exchange**, *University of California, San Diego*, San Diego, USA.

2015-2019 **B.E. Computer Science and Engineering**, *Northeastern University*, Shenyang, China.

Excellent Graduation Thesis. Outstanding Graduate. Outstanding Student for all years.

Relevant Industrial Experience

Nov. 2022- **Research Intern**, *Google Research*, Mountain View, USA.

Feb. 2023 Mentor: [Maryam Karimzadehgan](#)

- Research on topics (1) Multi-interest embedding, (2) Uncertainty embedding, and (3) Provider fairness in recommendation.

Jun. 2021- **Support Researcher, PhD Intern**, *Huawei Noah's Ark Lab*, Montreal, Canada.

Jun. 2022 Mentor: [Yingxue Zhang](#)

- Conduct one project on efficiently training the implicit feedback data for recommendation through adaptively learning the data importance.
- Conduct one project on efficiently utilizing auxiliary information in recommendation through self-supervised learning and contrastive alignment.

Publications - Click [this link](#) to reach my Google Scholar profile.

Journal Articles

- TOIS 2022 Haolun Wu, Chen Ma, Bhaskar Mitra, Fernando Diaz, and Xue Liu. **“A Multi-objective Optimization Framework for Multi-stakeholder Fairness-aware Recommendation”**. ACM Transactions on Information Systems (TOIS).

Conference Proceedings

- ICDE 2023 Haolun Wu, Chen Ma, Yingxue Zhang, Xue Liu, and Mark Coates. **“Self-supervised Contrastive Alignment for Tag-enhanced Recommendation”**. For the 39th IEEE International Conference on Data Engineering (ICDE 2023). Anaheim, USA. Apr. 2023.
- CIKM 2022 Haolun Wu, Chen Ma, Yingxue Zhang, Xue Liu, and Mark Coates. **“Adapting Triplet Importance of Implicit Feedback for Personalized Recommendation”**. In the 31st ACM International Conference on Information and Knowledge Management (CIKM 2022). Atlanta, USA. Oct. 2022.
- SIGIR 2022 Haolun Wu, Bhaskar Mitra, Chen Ma, Fernando Diaz, and Xue Liu. **“Joint Multisided Exposure Fairness for Recommendation”**. In the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2022, acceptance rate: $161/794 = 20\%$). Madrid, Spain. Jul. 2022.
- AAAI 2021 Chen Ma, Liheng Ma, Yingxue Zhang, Haolun Wu, Xue Liu, and Mark Coates. **“Knowledge-Enhanced Top-K Recommendation in Poincaré Ball”**. In the 35th AAAI Conference on Artificial Intelligence (AAAI 2021, acceptance rate: $1692/7911 = 21.4\%$). Virtual. Feb. 2021.
- AUTEEE 2019 Haolun Wu, Yunfei Feng. **“A Pioneering Scalable Self-driving Car Simulation Platform”**. In the IEEE 2nd International Conference on Automation, Electronics and Electrical Engineering (AUTEEE 2019). Shenyang, China. Nov. 2019.
- SMC 2018 Chong Fu, Yufu Shan, Muyang He, Ziyuan Yu, Haolun Wu. **“A New Medical Image Encryption Algorithm Using Multiple 1-D Chaotic Maps”**. In the IEEE International Conference on Systems, Man, and Cybernetics (SMC 2018). Miyazaki, Japan. Oct. 2018.
- ICCAIRO 2018 Yufu Shan, Muyang He, Ziyuan Yu, Haolun Wu. **“Pixel Level Image Encryption Based on Semantic Segmentation”**. In the IEEE International Conference on Control, Artificial Intelligence, Robotics and Optimization (ICCAIRO 2018). Prague, Czech Republic. May. 2018.

Patents

- Patent US 2022 Haolun Wu, Chen Ma, Yingxue Zhang, Mark Coates. **“Recommendation System With Adaptive Thresholds for Neighborhood Selection”**. US20220253722A1.
- IP Australia 2017 Haolun Wu, Haodong Lai, Yutao Liu, Wentao Zhou, and Qinlai Li. **“A Method For Real-Time Image Style Transfer Based On Conditional Generative Adversarial Networks ”**. AU2017101166A4.

In Submission or Under Review

Conference Proceedings

- WSDM 2023 Ziqi Zhao, Wei Guo, Haolun Wu, Yingxue Zhang, Jianye Hao, and Ruiming Tang. **“Coarse-to-Fine Multi-Interest Learning Framework for Multi-Behavior Recommendation”**. For the 16th ACM International Conference on Web Search and Data Mining (WSDM 2023).
- Under Construction Haolun Wu, Bowei He, Chen Ma, and Xue Liu. **Bandit Algorithms for Diversity and Fairness in Online Recommendation.**

Survey Papers

Haolun Wu, Yansen Zhang, Chen Ma, Bhaskar Mitra, Fernando Diaz, Nick Craswell, Charles Clarke, and Xue Liu. “**Diversity in Search and Recommendation: A Survey**”.

Haolun Wu, Hillary Tao, Jose Diaz, Peng Xu, Shuo Wang, and Xue Liu. “**Intelligent Techniques in Dynamic Call Routing: A Survey**”.

Grants & Fellowships

Total funding: \$211,000. Total share of funding: \$105,500.

- 2022 MSR-MILA Collaboration Grant (\$66,000, share 50%)
Lead PI: Xue (Steve) Liu; Industrial Mentor: John Winn, Bhaskar Mitra
Title: Neural Knowledge Modeling
Funding Body: Microsoft Research
- 2022 MITACS Accelerate Fellowship (\$90,000, share 50%)
Lead PI: Xue (Steve) Liu; Industrial Mentor: Shuo Wang
Title: Fairness-aware Matching for Dynamic Predictive Behavior Matching
Funding Body: Bell Canada, MITACS
- 2020 MSR-MILA Collaboration Grant (\$55,000, share 50%)
Lead PI: Xue (Steve) Liu; Industrial Mentor: Fernando Diaz
Title: [Two-sided Recommendation with Fairness](#)
Funding Body: Microsoft Research

Honors & Awards

Total award amount: \$33,400.

- 2022 Grad Excellence Award (\$7,000), *McGill University*
- 2022 SIGIR Student Travel Grant. (\$1,350+\$850)
- 2021 Apple Scholars PhD Fellowship Nominee (1 out of 3 students at *McGill University*)
- 2020 Grad Excellence Award (\$12,600), *McGill University*
- 2019 Excellent Graduation Thesis, *Northeastern University*
- 2016-2019 Outstanding Student (\$2,400), *Northeastern University*
- 2017 HUAWEI Scholarship (\$1,000), *Huawei Technologies Co., Ltd.*
- 2017 First Prize, *CUMCM (Contemporary Undergraduate Mathematical Contest in Modelling)*
- 2017 MCM/ICM Meritorious Winner, *COMAP (Consortium for Mathematics and Its Application)*
- 2016 Yao Tianshun Scholarship (\$1,000, 2 out of 250 students), *Northeastern University*
- 2014 First Prize (rank 18th in Sichuan Province), *CMS (Chinese Mathematical Association)*

Community

- **Founder and Organizer**

- I co-found and organize a reading group [DEFIRST](#) at MILA - Quebec AI Institute and the Vector Institute to build an interdisciplinary forum of researchers, students and professors alike, across both industry and academia, who work at the intersection of IR, Search, Fairness, and Trustworthy AI.

- **Session Chair**

- SIGIR 2022 (Session: Collaborative Filtering)

○ Reviewer

- AAAI 2022
- SIGIR 2022
- TKDD 2022

————— Talk, Teaching & Mentorship

○ Giving Guest Lecture or Teaching

- **Teach:** *"Applications of Machine Learning in Real World Systems"* (COMP 597 & 598).
Head: Xue (Steve) Liu. McGill University. Winter 2021 & 2022.
- **Talk:** *"Multi-FR: A Multi-Objective Optimization Method for Achieving Two-sided Fairness in E-commerce Recommendation"*, Microsoft Bing.
Head: [Nick Craswell](#). Oct. 2021.
- **Talk:** *"Joint Multisided Exposure Fairness for Search and Recommendation"*.
Microsoft Bing. Apr. 2022.; Bell Canada. Aug. 2022.; MILA. Sep. 2022.

○ Mentored / Collaborated with several undergraduate and junior graduate students. (2022-)

- Hillary Tao (McGill)
- Yansen Zhang (CityU of Hong Kong)
- Rui Song (McGill)
- Evelyn Cao (McGill)

————— Coding Skills

I am proficient in **Python** and **Pytorch**, also familiar with **Tensorflow**.

————— Life Skills

- I am a certificated **clarinet player**. I was a member of Musicians Association of Sichuan, China. My advisor was Yi Zhu, who is now a Deputy Director of the Music Department of Sichuan University.
- I am also a master in **Chinese Calligraphy**. My advisor was Jialin Zheng, who is now a Vice Chairman of Sichuan Calligraphers Association and Vice Chairman of Chengdu Calligraphers Association.

————— References

○ Xue (Steve) Liu

Fellow of Canadian Academy of Engineering
Fellow of IEEE
Associate Member at MILA
Professor, School of Computer Science
McGill University, Montreal, Canada
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○ Fernando Diaz

Research Scientist
Canadian CIFAR AI Chair
Industrial Core Member at MILA
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○ Bhaskar Mitra

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