Haolun Wu

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

Information Retrieval · Recommender System · Fairness · Continual Learning · Trustworthy AI

Academic Studies & Diplomas

2021-present **Ph.D. Computer Science**, *McGill University & MILA*, Montreal, Canada.
Advisor: Xue (Steve) Liu (FCAE, FIEEE), Fernando Diaz (CIFAR AI Chair)
Supervisory committee: Laurent Charlin (CIFAR AI Chair), Golnoosh Farnadi (CIFAR AI Chair)
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

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

Sep. 2022- **Research Intern (offer accepted)**, *Google Research*, Mountain View, USA.
Dec. 2022 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

Conference Proceedings

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.

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).

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 Under Review 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).

ICDE 2023 Under Review 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).

Haolun Wu. **Bandit Algorithms for Diversity and Fairness in Online Recommendation**.

Survey Papers

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

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

Grants & Fellowships

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

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 18^{th} 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
  Professor, School of Computer Science
  McGill University, Montreal, Canada
  xue.liu@mcgill.ca

- Fernando Diaz
  Research Scientist
  Google Research, Montreal, Canada
  diazf@acm.org

- Bhaskar Mitra
  Principal Researcher
  Microsoft Research, Montreal, Canada
  bhaskar.mitra@microsoft.com