

# FUYUAN LYU

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## SUMMARY

I'm currently a Ph.D. candidate at McGill University. I am fortunate to be advised by Prof Jin L.C. Guo and Prof Xue(Steve) Liu.

Prior to joining McGill, I got my bachelor's degree in Computer Science and Zhiyuan Honour Degree in Engineering from Shanghai Jiao Tong University(SJTU). I was advised by Prof Li Jiang for my thesis and worked with Prof Xiaokang Yang.

My research interest lies in utilizing Recommender Systems and Graph Neural Networks in the Software Engineering domain.

## EDUCATION

- PhD, Computer Science, McGill University, 2019-2024(exp.)
- BEng, Computer Science, Shanghai Jiao Tong University, 2015-2019
- Zhiyuan Honor Degree for BEng, Shanghai Jiao Tong University, 2015-2019

## SELECTED PUBLICATIONS & PREPRINT

### Conference:

- c7 Dugang Liu, Chaohua Yang, Xing Tang, Yejing Wang, **Fuyuan Lyu**, Weihong Luo, Xiuqiang He, Zhong Ming, Xiangyu Zhao, "MultiFS: Automated Multi-Scenario Feature Selection in Deep Recommender Systems", *In Proceedings of the 17th ACM International Conference Web Search and Data Mining (WSDM 2024)*
- c6 **Fuyuan Lyu**, Xing Tang, Dugang Liu, Chen Ma, Weilong Luo, Xiuqiang He, Xue Liu, "Towards Hybrid-grained Feature Interaction Selection for Deep Sparse Network", *In Proceedings of the 37th Conference on Neural Information Processing Systems (NeurIPS 2023)*
- c5 Xing Tang, Yang Qiao, Yuwen Fu, **Fuyuan Lyu**, Dugang Liu, Xiuqiang He, "OptMSM: Optimizing Multi-Scenario Modeling for Click-Through Rate Prediction", *In Proceedings of Machine Learning and Knowledge Discovery in Databases: Applied Data Science and Demo Track 2023 (ECML-PKDD 2023)*
- c4 Dugang Liu, Xing Tang, Han Gao, **Fuyuan Lyu**, Xiuqiang He, "Explicit Feature Interaction-aware Uplift Network for Online Marketing", *In Proceedings of The 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2023)*
- c3 **Fuyuan Lyu**\*, Xing Tang\*, Dugang Liu, Chen Liang, Xiuqiang He, Xue Liu, "Optimizing Feature Set for Click-through Rate Prediction", *In Proceedings of The Web Conference 2023 (WWW 2023)*
- c2 **Fuyuan Lyu**\*, Xing Tang\*, Hong Zhu, Huifeng Guo, Yingxue Zhang, Ruiming Tang, Xue Liu, "OptEmbed: Learning Optimal Embedding Table for Click-through Rate Prediction", *In Proceedings of the 31st ACM International Conference on Information and Knowledge (CIKM 2022)*
- c1 **Fuyuan Lyu**\*, Xing Tang\*, Huifeng Guo, Ruiming Tang, Xiuqiang He, Rui Zhang, Xue Liu, "Memorize, Factorize, or be Naïve: Learning Optimal Feature Interaction Methods for CTR Prediction", *In Proceedings of the 38th IEEE International Conference on Data Engineering (ICDE 2022)*

### Preprint:

- i5 **Fuyuan Lyu**, Yaochen Hu, Xing Tang, Yingxue Zhang, Ruiming Tang, Xue Liu, "Towards Automated Negative Sampling in Implicit Recommendation", *CoRR*, Nov 2023
- i4 **Fuyuan Lyu**, Xing Tang, Dugang Liu, Haolun Wu, Chen Ma, Xiuqiang He, Xue Liu, "Feature Representation Learning for Click-through Rate Prediction: A Review and New Perspectives", *CoRR*, Feb 2023
- i3 Haolun Wu, Yansen Zhang, Chen Ma, **Fuyuan Lyu**, Fernando Diaz, Xue Liu. "A Survey of Diversification Techniques in Search and Recommendation", *CoRR*, Dec 2022
- i2 Yuecai Zhu, **Fuyuan Lyu**, Chengming Hu, Xi Chen, Xue Liu, "Encoder-Decoder Architecture for Supervised Dynamic Graph Learning: A Survey", *CoRR*, Mar 2022
- i1 **Fuyuan Lyu**, Shien Zhu, Weichen Liu. "Cross-filter compression for CNN inference acceleration", *CoRR*, May 2020.

## RESEARCH EXPERIENCE

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### McGill University

Research Assistant

Sept 2019 to present

Advisor: [Prof. Jin L.C. Guo](#) & [Prof. Xue\(Steve\) Liu](#)

- Towards Hybrid-grained Feature Interaction Selection in Deep Sparse Network: Propose to select feature interaction at different granularity in deep sparse network. The paper is accepted in NeurIPS 2023.
- Optimizing Feature Set for CTR Prediction: Jointly consider the influence of selecting feature and feature interaction in CTR Prediction. Propose an automated method to select both feature and feature interactions. The paper is accepted in WWW 2023.

### Huawei Noah's Ark Lab, Canada

Research Intern

November 2021 to Jun 2023

Advisor: [Yingxue Zhang](#)

- Optimal Embedding Table for CTR Prediction: Study the influence of the size of the embedding table in CTR Prediction. Propose a unified framework to optimize the size of the embedding table and model parameters automatically. The paper is accepted in CIKM 2022.

### Huawei Noah's Ark Lab

Research Intern

March 2021 to August 2021

Advisor: [Dr. Xing Tang](#)

- Optimal Modelling Methods for Feature Interaction in CTR Prediction: Study the influence of modeling methods for feature interaction. Propose a novel deep CTR prediction framework including various modeling methods and a two-stage learning algorithm to automatically select the optimal for each feature interaction. The paper is accepted in ICDE 2022.

### Shanghai Jiao Tong University

Research Assistant

Feb 2019 to Aug 2019

Advisor: [Prof. Li Jiang](#)

- Dual-flow Training Framework to Exploit Structured Sparsity: Support structured sparsity from framework level. Propose a flexible dual-flow mechanism to decouple the non-zero data and the sparse network structure. Integrate the dual-flow mechanism into the deep learning compiler stack built on TVM.

### Nanyang Technological University

Research Assistant

Aug 2018 to Feb 2019

Advisor: [Prof. Weichen Liu](#)

- Cross-filter Compression: Address the conflict between uniform quantization and compact network design when speedup CNN. Explored CNN spatial-adjunct layer property and proposed cross-filter compression method.

### Shanghai Jiao Tong University

Research Assistant

Jun 2017 to Feb 2018

Advisor: [Prof. Xiaokang Yang](#)

- Explored the possibility of more realistic cloth transfer by generating and transferring structure in 3D dimension.
- Designed a specific generative adversarial network to animate cartoon figures.

## TEACHING AND MENTORING EXPERIENCE

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- 2020 Winter - COMP303 Teaching Assistant
- Reviewer of WWW, AAAI, CIKM, WSDM

## SELECTED AWARDS

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- NeurIPS Financial Assistance, 2023
- McGill GREAT Award for NeurIPS, 2023
- SIGIR Student Travel Grant for CIKM, 2022
- Wolfe Fellowship in Sci & Tech, 2019-2022
- Grad Excellence Award of McGill University, 2019-2024
- Zhiyuan Honor Degree of Engineering of Shanghai Jiao Tong University(1%), 2019
- Zhiyuan Oversea Research Scholarship (1st class) of Shanghai Jiao Tong University, 2019
- Zhiyuan Outstanding Student Scholarship of Shanghai Jiao Tong University(5%), 2019
- Microsoft Intelligence Award , awarded to 4/438 participants in the 1st HACKxFDU Hackathon, 2016.

## SKILLS

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**Software** Python, C++, Java

**Languages** English: Professional Proficiency. Mandarin: Native. French: Just a few words.