Zhuoning GUO

INFORMATION RETRIEVAL · MULTIMODAL LARGE LANGUAGE MODELS · RECOMMENDER SYSTEMS

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Educations

The Hong Kong University of Science and Technology (Guangzhou) *Guangzhou, Guangdong, China*

PH.D. IN ARTIFICIAL INTELLIGENCE, INFORMATION HUB *Sep. 2022 - Oct. 2026 (Expected)*

• Supervisor: Prof. Xiaowen Chu (IEEE Fellow)

Harbin Institute of Technology *Harbin, Heilongjiang, China*

B.E. IN SOFTWARE ENGINEERING *Aug. 2018 - Jun. 2022*

• GPA: 3.6/4.0 (Overall rank: Top 7%)

Internships

Alibaba Tongyi Lab *Hangzhou, Zhejiang, China*

RESEARCH INTERN *Mar. 2025 - Jan. 2026*

• **Topics:** Foundational embedding models for multimodal retrieval
• **Contributions:** Develop the open-source state-of-the-art multimodal video embedding model trained on 13M+ public data with 6.5+% improvement on universal video retrieval tasks, laying a foundation of Qwen3-VL-Embedding series for video retrieval abilities

Baidu Recommendation Architecture Department *Remote*

RESEARCH INTERN *Feb. 2024 - Feb. 2025*

• **Topics:** Information retrieval for web-scale recommender system
• **Contributions:** Propose an industrial training-inference co-designed retrieval framework with improvements of 20+% on ANNS, 1.0+% on ToP, and 0.5+% on DAU; This framework is deployed in 20+ applications for 100M+ video recommendations with 100M+ requests per second

Baidu Research *Haidian, Beijing, China*

RESEARCH INTERN *Oct. 2021 - Aug. 2022*

• **Topics:** Spatial-temporal modeling for business intelligence
• **Contributions:** Design a predictive and analytical framework for the nationwide labor market understanding, including forecasting models, scientific discoveries, and proprietary reports

Tencent AI Lab *Remote*

RESEARCH INTERN *May 2021 - Oct. 2021*

• **Topics:** Graph learning for social science
• **Contributions:** Support research on non-pharmaceutical interventions in COVID-19 by modeling human mobility for contact reduction

Microsoft Research Asia (MSRA) *Haidian, Beijing, China*

RESEARCH INTERN *Nov. 2020 - Apr. 2021*

• **Topics:** Computer vision and graphics for design intelligence
• **Contributions:** Support intelligent slides refinement suggestion via deep learning of layout autoencoder and aesthetic evaluator, back-end and front-end development of a plug-in in Microsoft PowerPoint

Publications

[1] **Towards Universal Video Retrieval: Generalizing Video Embedding via Synthesized Multimodal Pyramid Curriculum** *[Paper] [Page]*

Zhuoning Guo, Mingxin Li, Yanzhao Zhang, Dingkun Long, Pengjun Xie, Xiaowen Chu

arXiv preprint

[2] **GPU-accelerated Multi-relational Parallel Graph Retrieval for Web-scale Recommendations** *[Paper]*

Zhuoning Guo, Guangxing Chen, Qian Gao, Xiaochao Liao, Jianjia Zheng, Lu Shen, Hao Liu

Proceedings of the ACM on Web Conference 2026

[3] **HiFGL: A Hierarchical Framework for Cross-silo Cross-device Federated Graph Learning** *[Paper]*

Zhuoning Guo, Duanyi Yao, Qiang Yang, Hao Liu

Proceedings of the 30th ACM SIGKDD Conference on Knowledge Discovery and Data Mining 2024 **(Oral)**

[4] **Talent Demand-Supply Joint Prediction with Dynamic Heterogeneous Graph Enhanced Meta-Learning** *[Paper]*

Zhuoning Guo, Hao Liu, Le Zhang, Qi Zhang, Hengshu Zhu, Hui Xiong

Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining 2022 **(Oral)**

[5] **Labor Migration Modeling through Large-scale Job Query Data** *[Paper]*

Zhuoning Guo, Le Zhang, Hengshu Zhu, Weijia Zhang, Hui Xiong, Hao Liu

Advances in Knowledge Discovery and Data Mining: 28th Pacific-Asia Conference on Knowledge Discovery and Data Mining 2025 **(Oral)**

[6] **Against Multifaceted Graph Heterogeneity via Asymmetric Federated Prompt Learning** *[Paper]*

Zhuoning Guo, Ruiqian Han, Hao Liu

arXiv preprint

[7] **Discrepant Homophily Co-Preserved Graph Convolutional Network for Labor Migration Forecasting** *[Paper]*

Zhuoning Guo, Le Zhang, Hengshu Zhu, Weijia Zhang, Hui Xiong, Hao Liu

Workshop of Talent Management Computing (TMC) at SIGKDD 2024

[8] **Convergence-aware Clustered Federated Graph Learning Framework for Collaborative Inter-company Labor Market Forecasting** *[Paper]*

Zhuoning Guo, Hao Liu, Le Zhang, Qi Zhang, Hengshu Zhu, Hui Xiong

arXiv preprint

[9] **Human Mobility Modeling During the COVID-19 Pandemic via Deep Graph Diffusion Infomax** *[Paper]*

Yang Liu, Yu Rong, Zhuoning Guo, Nuo Chen, Tingyang Xu, Fugee Tsung, Jia Li

Proceedings of the Thirty-Seventh AAAI Conference on Artificial Intelligence 2023

[10] **A Cross-View Hierarchical Graph Learning Hypernetwork for Skill Demand-Supply Joint Prediction** *[Paper]*

Wen Shuo Chao, Zhaopeng Qiu, Likang Wu, Zhuoning Guo, Zhi Zheng, Hengshu Zhu, Hao Liu

Proceedings of the Thirty-Eighth AAAI Conference on Artificial Intelligence 2024 **(Oral)**

[11] **Aesthetics++: Refining Graphic Designs by Exploring Design Principles and Human Preference** *[Paper]*

Wenyuan Kong, Zhaoyun Jiang, Shizhao Sun, Zhuoning Guo, Weiwei Cui, Ting Liu, Jian-Guang Lou, Dongmei Zhang

IEEE Transactions on Visualization & Computer Graphics

Visits

The Hong Kong University of Science and Technology *Hong Kong, China*

Visiting Ph.D. Student *Jan. 2024 - Aug. 2024*

- Affiliated to the Department of Computer Science and Engineering during the visiting period

University of Cambridge *Cambridge, England, UK*

Visiting Undergraduate *Jan. 2020 - Feb. 2020*

- Supported by the scholarship from Harbin Institute of Technology (HIT) for the undergraduate visiting program

Awards

2014.11	**First Award, Junior High School, National Olympiad in Informatics in Provinces (NOIP),** Independent Recruitment Admission Qualification of Fuzhou No.1 High School	*Fujian, China*
2016.11	**First Award, Senior High School, National Olympiad in Informatics in Provinces (NOIP),** Independent Recruitment Admission Qualification of Harbin Institute of Technology	*Fujian, China*
2020.03	**Finalist (Top 1%), Mathematical Contest in Modeling (MCM),** Team Leader	*International*
2020.08	**Special Award (Top 4), National IoT Competition (Northeast Region),** Team Leader	*Northeast China*
2019.10	**First Award, Contemporary Undergraduate Mathematical Contest in Modeling,** Team Leader	*China*

Honors

2025	**Outstanding Reviewer,** SIGKDD 2025	*International*
2019	**Outstanding CLP Member,** Harbin Institute of Technology	*University*
2020	**Outstanding Student Cadre,** Harbin Institute of Technology	*University*

Services

2025	**Session Chair**, SIGKDD 2025	*International*
2022-2025	**Conference Reviewer**, SIGKDD, NeurIPS, ICLR, WebConf, IJCAI, ICDM	*International*
2024-2025	**Journal Reviewer**, TOIS, Information Science	*International*
2023	**Teaching Assistant**, AIAA 5028: Machine Learning on Graphs at HKUST(GZ)	*University*
2026	**Teaching Assistant**, UFUG 2602: Data Structure and Algorithm Design at HKUST(GZ)	*University*
2020-2022	**Chairman**, HIT Massive Data Club	*Laboratory*
2020-2022	**Captain**, The Football Team of the Faculty of Computing	*Department*
2019-2022	**President**, HIT Chess Club	*Organization*

Volunteers

The Innovation & Entrepreneurship Education Alliance of China   *Harbin, Heilongjiang, China*

CONFERENCE VOLUNTEER   *Oct. 2019*

- Supported the annual national conference hosted by Harbin Institute of Technology, engaging with academic and industry stakeholders.

Rural Primary School   *Shangri-La, Yunnan, China*

TEACHING VOLUNTEER   *Jan. 2019 - Feb. 2019*

- Delivered foundational lessons to students in an underserved rural community, emphasizing clarity and accessibility in knowledge transfer.

Skills

Languages (English)	IELTS 6.5 (5.5), Aug. 2021
Programming Languages	Python (Recently), C/C++, Java, Bash, C#
Frameworks & Tools	PyTorch (-Lightning), Transformers, Deepspeed, vLLM, Pandas, DGL, PyG, NetworkX, …