

Zhuoning GUO

INFORMATION RETRIEVAL · MULTIMODAL LARGE LANGUAGE MODELS · AGENTS

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Educations

The Hong Kong University of Science and Technology (Guangzhou)

PH.D. IN ARTIFICIAL INTELLIGENCE, INFORMATION HUB

- Supervisor: Prof. Xiaowen Chu (IEEE Fellow)

Guangzhou, Guangdong, China

Sep. 2022 - Oct. 2026 (Expected)

Harbin Institute of Technology

B.E. IN SOFTWARE ENGINEERING

- GPA: 3.6/4.0 (Overall rank: Top 7%)

Harbin, Heilongjiang, China

Aug. 2018 - Jun. 2022

Internships

Alibaba Tongyi Lab

RESEARCH INTERN

- 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

Hangzhou, Zhejiang, China

Mar. 2025 - Jan. 2026

Baidu Recommendation Architecture Department

RESEARCH INTERN

- 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

Remote

Feb. 2024 - Feb. 2025

Baidu Research

RESEARCH INTERN

- 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

Haidian, Beijing, China

Oct. 2021 - Aug. 2022

Tencent AI Lab

RESEARCH INTERN

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

Remote

May 2021 - Oct. 2021

Microsoft Research Asia (MSRA)

RESEARCH INTERN

- 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

Haidian, Beijing, China

Nov. 2020 - Apr. 2021

Projects

Qwen3-VL-Embedding

RESEARCH INTERN

- Preliminary research on video embedding ability, including training, 10M+ data collection/processing/synthesis, and evaluation; Produce two academic papers about this topic
- Qwen3-VL-Embedding series has been downloaded 10M+ times on HuggingFace, which is the new state-of-the-art on video retrieval tasks after the GVE series

Alibaba Tongyi Lab

Mar. 2025-Jan. 2026

Campus Agent

PH.D. STUDENT AND PROJECT LEADER

- Developed a campus AI agent for HKUST(GZ) students and staff, integrating planning, retrieval, and execution modules to support academic and administrative tasks, including enrollment recommendation, supervisor matching, policy clarification, and career planning
- Implemented hybrid retrieval with knowledge graph and hierarchical chunking, fusing public web data with private campus documents to handle both in-domain and out-of-domain queries; Deployed OpenClaw adapted to campus websites for conversational task execution (report submission, room scheduling, class enrollment), with memory constructed from secure scraping of user campus data

HKUST(GZ)

Nov. 2025-Now

- [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 (Submitted to ICML 2026)
- [2] **Demystifying Spatial-temporal Scaling Laws of Multimodal Video Embeddings**
Zhuoning Guo, Tingyu Song, Mingxin Li, Yanzhao Zhang, Dingkun Long, Pengjun Xie, Xiaowen Chu
arXiv preprint (Submitted to ECCV 2026)
- [3] **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
- [4] **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)
- [5] **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)
- [6] **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)
- [7] **Against Multifaceted Graph Heterogeneity via Asymmetric Federated Prompt Learning** [Paper]
Zhuoning Guo, Ruiqian Han, Hao Liu
arXiv preprint (Submitted to ECML 2026)
- [8] **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
- [9] **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
- [10] **Rethinking Composed Image Retrieval Evaluation: A Fine-Grained Benchmark from Image Editing** [Paper]
Tingyu Song, Yanzhao Zhang, Mingxin Li, Zhuoning Guo, Dingkun Long, Pengjun Xie, Siyue Zhang, Yilun Zhao, Shu Wu
arXiv preprint
- [11] **VimRAG: Navigating Massive Visual Context in Retrieval-Augmented Generation via Multimodal Memory Graph** [Paper]
Qiuchen Wang, Shihang Wang, Yu Zeng, Qiang Zhang, Fanrui Zhang, Zhuoning Guo, Bosi Zhang, Wenxuan Huang, Lin Chen, Zehui Chen, Pengjun Xie, Ruixue Ding
arXiv preprint
- [12] **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
- [13] **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)
- [14] **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

VISITING PH.D. STUDENT

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

Hong Kong, China

Jan. 2024 - Aug. 2024

University of Cambridge

VISITING UNDERGRADUATE

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

Cambridge, England, UK

Jan. 2020 - Feb. 2020

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, ICML, WebConf, IJCAI, ICDM	International
2024-2025	Journal Reviewer , TOIS, TCSVT, 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

CONFERENCE VOLUNTEER

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

Harbin, Heilongjiang, China

Oct. 2019

Rural Primary School

TEACHING VOLUNTEER

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

Shangri-La, Yunnan, China

Jan. 2019 - Feb. 2019

Skills

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