

Qi Huang

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EDUCATION

The University of Chicago

M.Sc. in Computational and Applied Mathematics

Sept 2025 – Jun 2027

Chicago, US

The University of Liverpool

B.Sc. in Mathematics, First Class Honours · Ranked Top 1% in Major

Sept 2023 – Jun 2025

Liverpool, UK

Xi'an Jiaotong-Liverpool University

B.Sc. in Applied Mathematics

Sept 2021 – Jul 2023

Suzhou, China

RESEARCH EXPERIENCE

Causal Inference for Observational Studies

Nov 2025 – Present

University of Chicago, Department of Statistics | Mentor: Prof. Xinran Li

- Conducting methodological research on matched observational studies, covariate-adaptive randomization inference, and sensitivity analysis under hidden bias; manuscript in preparation (details omitted).

Scientific World Models and LLM Agents

Mar 2026 – Present

Princeton University, Zhuang Lab | Mentor: Prof. Zhuang Liu

- Building a scientific world model that predicts outcomes of candidate research actions (research state + action → predicted outcome) to guide autonomous experiment planning with agents and vision-language models.
- Designed mechanism-aware predictors and a test-time selective-adaptation router for out-of-distribution generalization across unseen action families; reduced planner regret by ~80% in held-out replay evaluations.

AI Breakthroughs and Intellectual Diversity

Sept 2025 – Jul 2026

University of Chicago, Knowledge Lab | Mentor: Prof. James A. Evans

- Led mathematical modeling for a large-scale study of how AI breakthroughs concentrate scientific attention and erode intellectual diversity, drawing on 7.18M papers, 73K peer reviews, and 3.7M scientists across 36 years.
- Co-authored the resulting manuscript, “Stronger Artificial Intelligence Breakthroughs Hasten Their Own Exhaustion”; submitted to Science.

Audio-Visual Test-Time Adaptation

Sept 2025 – Jun 2026

University of Wisconsin–Madison | Mentor: Prof. Xiao Luo

- Developed an audio-visual test-time adaptation framework under severe distribution shift using binary modality accept/reject gating rather than softmax-style weighting.
- Designed learned attention maps with entropy-adaptive token dropout, curriculum annealing, and class-specific thresholds to reduce overfitting to noisy pseudo-labels.

SELECTED PUBLICATIONS

- Yuxuan Hu, Yushan Pan, Minghui Zhu, Xiaojiang He, **Qi Huang**, Hao Wang, Yanlong Cao, Zhijie Xu. *QEGF: A Quantum-Inspired Geometric and Energy-Based Fusion Framework for Multimodal Sentiment Analysis*. Major revision, IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- Pengyun Wang, Junyu Luo, Yanxin Shen, Ming Zhang, Shaoen Qin, Hanwen Xing, Siyu Heng, **Qi Huang**, Xiao Luo. *A Comprehensive Graph Pooling Benchmark: Effectiveness, Robustness and Generalizability*. Major revision, ACM Transactions on Knowledge Discovery from Data (TKDD)
- **Qi Huang**, Xiao Luo. *Half-routing Consistency Guidance with Batch-aware Gating for Audio-Visual Test-Time Adaptation*. Submitted to ACM International Conference on Information and Knowledge Management (CIKM)
- Jia Huang, Hongyou Zhou, **Qi Huang**, Hongbin Liu, Peng Zhang, Zhengqi Sun, Lumin Xu. *LoVI-DPO: Informative-Safe Preference Mining with Region-Aware Optimization for Video Inpainting*. Submitted to AAAI Conference on Artificial Intelligence (AAAI) 2027
- Beichen Lu, Honglin Bao, **Qi Huang**, Qingguo Meng, James A. Evans. *Stronger Artificial Intelligence Breakthroughs Hasten Their Own Exhaustion*. Submitted to Science

INTERNSHIPS

iFLYTEK

Jun 2025 – Sept 2025

Machine Learning Research Intern

Hefei, China

- Trained and evaluated Transformer baselines in PyTorch on in-house text corpora; improved BLEU by +2.3 (27.6 → 29.9) through regularization and decoding tuning.
- Trained Conformer baselines on internal speech data; reduced WER from 10.3% to 8.9% via LR scheduling, SpecAugment, and label smoothing.

Alibaba Group

Jul 2024 – Aug 2024

Data Analyst Intern, Finance Department

Hangzhou, China

- Cleaned and analyzed consumer data using AARRR metrics; supported retention analysis and precision marketing with RFM-based customer segmentation.
- Built activity and retention visualizations in Matplotlib and Pandas to support management decision-making.

ACADEMIC SERVICE

Reviewer: Forecast@ICML 2026 Workshop (Forecasting as a New Frontier of Intelligence)

SKILLS

Programming: Python, SQL, R, MATLAB, Java, VBA, Maple

Tools: PyTorch, Pandas, Matplotlib, Tableau, Power BI, Jupyter Notebook, LaTeX, Excel