# Kaishuai Xu

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## EDUCATION

**The Hong Kong Polytechnic University (PolyU)**                    *Sept. 2021 –*
PhD Student in Computer Science, guided by Prof. Wenjie Li                    Hong Kong, China

- Focusing on LLM reasoning, conversational AI;

**Huazhong University of Science and Technology (HUST)**          *Sept. 2017 – June 2020*
Master of Management Science and Engineering, guided by Prof. Yukun Bao                    Wuhan, China

- Focusing on time series forecasting; Cumulative GPA: 88.49/100; Courses: Matrix theory, Deep Learning;

**Huazhong University of Science and Technology (HUST)**          *Sept. 2013 – June 2017*
Bachelor of Management in Management Science at Qiming College                    Wuhan, China

- Cumulative GPA: 3.91/4 (3/19*); Courses: C++ programming, Linear algebra, Mathematical Analysis I&II;
- (Students at Qiming College are selected from 120+ people who have passed the examinations and interviews and are trained with academic orientation)

## SELECTED PUBLICATIONS (LLM)

- 🩺 **RAR$^2$: Retrieval-Augmented Medical Reasoning via Thought-Driven Retrieval.** Kaishuai Xu, Wenjun Hou, Yi Cheng, Wenjie Li. *Submit to EMNLP 2025*.
- 🧑‍⚖️ **Learning to Align Multi-Faceted Evaluation: A Unified and Robust Framework.** Kaishuai Xu, Tiezheng Yu, Wenjun Hou, Yi Cheng, Liangyou Li, Xin Jiang, Lifeng Shang, Qun Liu, Wenjie Li. *In Findings of the Association for Computational Linguistics: ACL 2025*.
- 🤔 **Subtle Errors in Reasoning: Preference Learning via Error-injected Self-editing.** Kaishuai Xu, Tiezheng Yu, Wenjun Hou, Yi Cheng, Chak Tou Leong, Liangyou Li, Xin Jiang, Lifeng Shang, Qun Liu, Wenjie Li. *In Proceedings of the Annual Meeting of the Association for Computational Linguistics: ACL 2025*.
- 🩺 **Large Language Models for Disease Diagnosis: A Scoping Review.** Shuang Zhou, Zidu Xu, Mian Zhang, Chunpu Xu, Yawen Guo, Zaifu Zhan, Sirui Ding, Jiashuo Wang, Kaishuai Xu, Yi Fang, Liqiao Xia, Jeremy Yeung, Daochen Zha, Mingquan Lin, Rui Zhang. *npj Artificial Intelligence.*
- 🩺 **Reasoning Like a Doctor: Improving Medical Dialogue Systems via Diagnostic Reasoning Process Alignment.** Kaishuai Xu, Yi Cheng, Wenjun Hou, Qiaoyu Tan, Wenjie Li. *In Findings of the Association for Computational Linguistics: ACL 2024*.

## SELECTED PUBLICATIONS (OTHERS)

- 🩺 **Medical Dialogue Generation via Intuitive-then-Analytical Differential Diagnosis.** Kaishuai Xu, Wenjun Hou, Yi Cheng, Jian Wang, Wenjie Li.
- 🩺 **Medical Dialogue Generation via Dual Flow Modeling.** Kaishuai Xu, Wenjun Hou, Yi Cheng, Jian Wang, Wenjie Li. *In Findings of the Association for Computational Linguistics: ACL 2023*.
- **Research on Probabilistic Load Forecasting for Regional Residential Users Based on Single Value Cluster Analysis.** Chengwen Xia, Kaishuai Xu, Yukun, Bao, Rui Pan, Yuanbin Deng. *Electric Power Information and Communication Technology*. 2021.
- **POLYU at TREC 2020 Conversational Assistant Track: Query Reformulation with Heuristic Topic Phrases Discovery.** Kaishuai Xu, Wenjie Li, Yongqi Li. *TREC 2020*.

## WORK EXPERIENCE

**Research Intern**                    *June 2024 –*
Noah's Ark Lab, Huawei Hong Kong Research Center                    Hong Kong, China

- Developed and evaluated LLM-based reasoning models, optimizing performance through systematic experimentation with architectures and datasets. Our proposed method **RISE** achieves substantial improvements in accuracy on mathematical reasoning benchmarks (GSM8K, MATH, Aqua, etc.) and logical reasoning datasets (e.g., ZebraLogic), along with a notable increase in pass@1 performance on code generation tasks (MBPP and HumanEval).
- Proposed a two-stage robust LLM evaluation framework **ARJudge** that incorporates multiple criteria and external tools to assess models' response quality. Judgment accuracy (Acc) and agreement (Agr) are used to measure evaluation performance.
- Collaborated with researchers to explore novel ML techniques (DPO, PPO, GRPO, etc.), contributing to advancements in AI-driven problem-solving.

**Research Assistant**  *Nov 2020 – Sept 2021*
PolyU NLP Group, HK PolyU  Hong Kong, China

- Developed a medical dialogue system in Chinese that can perform remote diagnosis and provide medication recommendations. It uses external expert knowledge (i.e., CMeKG) and doctor action prediction and enhances responses by retrieval-augmented generation (RAG).
- Developed a conversational search system by training dense retriever (DPR), which achieves search in an iterative conversational way.

**Data Analyst Intern**  *July 2019 – Sept. 2019*
AliExpress, Alibaba Group  Hangzhou, China

- Developed time-series forecasting models to predict Gross Merchandise Volume (GMV) for the next 7 days, improving prediction accuracy by 5%. SVM and Linear Regression are used to help with prediction. Several moving average indicators are employed as key factors.
- Applied NLP techniques (e.g., NER, text classification) for sentiment analysis and trend detection in social media data, improving product demand forecasting.

## RESEARCH EXPERIENCE

**Regional Load Forecasting for the State Grid of China (guided by Prof. Yukun Bao, HUST)**  *2018*

- Developed probabilistic models for time-series forecasting of electricity consumption, optimizing prediction accuracy for seasonal demand;
- Applied machine learning techniques (ARIMA, LSTMs, and regression models) to forecast monthly electricity loads across multiple provinces;
- Evaluated statistical models for prediction reliability, focusing on summer and winter demand peaks;

**The 2019 Online Projected-based Machine Learning Research Program Developing Fake News Detection Algorithms (guided by Mike Tamir, UC Berkeley)**  *2019*

- Developed an end-to-end pipeline that accomplishes fake news detection;

**TREC CAsT 2020 (guided by Prof. Wenjie Li, PolyU)**  *2020*

- Developed a rule-based conversational search framework with fine-tuning through BERT;
- Developed a web demo of the search framework;

## LEADERSHIP & AWARDS

- **Innovation Award (5/123, as a team leader)**. Global Optimization Challenge 2018, JD.com, Inc.  *2018*
- **Academic Scholarship (Master, First Prize)**. HUST.  *2018, 2017*
- **Academic Excellence Scholarship (Bachelor)**. HUST.  *2016, 2015*

## SKILLS

**Programming:** Python, C++
**Machine Learning & Data Science:** NLP, Deep Learning, Time-Series Forecasting, Statistical Modeling
**Libraries & Tools:**NumPy, Pandas, PyTorch, AWS, LangChain, SQL, verl, TRL, wandb