Shanghao Li

CS PhD Candidate · Machine Learning Scientist/Engineer

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Summary

I am a **third-year Ph.D. student** in Computer Science at the University of Illinois Chicago, advised by Professor **Philip S. Yu**.

My research focuses on building **trustworthy knowledge-augmented language models**. My research centers on developing trustworthy knowledge-augmented language models. I have worked on **Graph Retrieval-Augmented Generation (GraphRAG)**, with a focus on **hallucination detection** and **interpretable evaluation metrics**. More recently, I have been exploring **memory in Agent systems**, including **memory-aware RLHF** and **memory for human–agent collaboration**, aiming to advance trustworthy, adaptive, and long-term capable AI agents.

I am seeking a **internship** as an **Research Scientist** or **Machine Learning Engineer**, where I can contribute to advancing **trustworthy, efficient, and scalable AI systems**.

Education

University of Illinois at Chicago
Chicago, IL

Ph.D. in Computer Science | Advisor: Prof. Philip S. Yu
August 2023 - now

- Big Data and Social Computing (BDSC) Lab
- Research Interest: LLMs, Knowledge Graphs, LLM Alignment, Retrieval-Augmented Generation (RAG), Agent

The University of Hong Kong
Hong Kong, China

M.S. in Information Science
August 2021 - July 2023

Shandong University of Science and Technology
Shandong, China

B.S. in Electronic Information Science and Technology
September 2016 - July 2020

Industry and Research Experience

University of Illinois at Chicago
Chicago, IL

Research Assistant | Big Data and Social Computing (BDSC) Lab | Advisor: Philip S. Yu
August 2023 - Present

- Investigated how LLMs process and retain external or long-term knowledge, focusing on mechanisms that lead to hallucinations and knowledge utilization efficiency. Specifically, integrated retrieval-augmented generation (RAG), graph-structured knowledge, and agent memory to design interpretable metrics and lightweight detection methods that explain and prevent unreliable behavior while maintaining computational efficiency.

ByteDance
Shenzhen, China

Frontend Software Engineer (Declined Full-Time Offer to Pursue Ph.D.)
2023

- Develop front-end features for mobile applications.

The University of Hong Kong
Hong Kong, China

Research Assistant | Institute of Data Science | Advisor: Shihui feng
August 2021 - June 2023

- Conducted sentiment analysis and topic modeling on Reddit data to explore online education opinions (learners vs. educators); and analyzed social media strategies and sentiment toward NGOs to improve community engagement.

Dachu Information Technology
Shenyang, Liaoning, China

Machine Learning Engineer Intern
July 2021 - September 2021

- Built an end-to-end machine learning pipeline with RESTful APIs to support model training and real-time inference for AI bot interaction and recommendation in a meeting app.

Skills

Core ML & AI	Large Language Models, Transformers, RAG, Knowledge Graphs/KGs, GNNs (PyG/DGL), NLP, Reinforcement Learning, RLHF (PPO/DPO), Preference Optimization, Prompt Engineering, Evaluation (accuracy/F1/ROUGE/BLEU/perplexity)
LLM/RAG Ecosystem	Embeddings, Semantic Search, BM25/Elasticsearch/OpenSearch, FAISS/Milvus/Weaviate, ColBERT, Re-rankers, LangChain, LlamaIndex, Vector Databases, Chunking/Retrieval strategies
ML Frameworks	PyTorch, TensorFlow, Hugging Face (Transformers, datasets, tokenizers, sentence-transformers), Scikit-learn, PyTorch Lightning, DeepSpeed, FSDP/DDP, Ray Tune, Optuna, XGBoost
Data & Distributed Computing	Python, SQL/NoSQL (MongoDB), Pandas/Numpy/Scipy, PySpark/Spark, Ray/Dask, Databricks, Kafka, Neo4j, RDF/SPARQL
MLOps & Serving	Docker, Kubernetes, Kubeflow, Airflow, MLflow, Weights & Biases, CI/CD (GitHub Actions), FastAPI, TorchServe, NVIDIA Triton, ONNX/quantization/pruning, AWS (SageMaker/Bedrock), GCP (Vertex AI), Azure

Research and Publications

Detecting Hallucinations in Graph Retrieval-Augmented Generation via Attention Patterns and Semantic Alignment. *(In Submission to KDD 2026)*
Shanghao Li, Jinda Han, Yibo Wang, Yuanjie Zhu, Zihe Song, Langzhou He, Kenan Kamel A Alghythee, and Philip S. Yu.

Exploring User Preferences for Multi-Modal Human-AI Interaction in Image Editing Interface. *(In Submission to CHI 2026)*
Sean Kim, Shanghao Li, Kenan Kamel A Alghythee, Subha Ilamathy, and Nikita Soni.

A Comparative User Study of Physical versus Virtual Mobile Augmented Spherical Interfaces for Collaborative Geospatial Exploration in Earth Science Classrooms. *(In Submission to ISS 2026)*
Shanghao Li, Taylor Lane, Stefany Sit, and Nikita Soni.

FITMag: A Framework for Generating Fashion Journalism Using Multimodal LLMs, Social Media Influence, and Graph RAG.
Jinda Han, Mengyao Guo, Shanghao Li, Kailash Thiyagarajan, Zhinan Cheng, and Li Zhao.
Proceedings of the 16th International Conference on Applied Human Factors and Ergonomics (AHFE), Orlando, Florida, USA, July 26–30, 2025.

BIG-AOME: Designing Bodily Interaction Gamification Towards Anti-Sedentary Online Meeting Environments.
Jiaqi Jiang, Shanghao Li, Xian Li, Yingxin Xu, Jian Zhao, and Pengcheng An.
JMIR Serious Games, 13:e62778, 2025.

Towards Understanding Group Collaboration Patterns Around Mobile Augmented-Reality Interfaces for Geospatial Science Data Visualizations.
Shanghao Li, Taylor Lane, Alicia Hernandez, Vinayak Kabra, Karthik Singh, Stefany Sit, and Nikita Soni.
Extended Abstracts of the CHI Conference on Human Factors in Computing Systems, pp. 1–7, 2024.

Sentiment Analysis and Topic Modeling Regarding Online Classes on the Reddit Platform: Educators Versus Learners.
Shanghao Li, Zerong Xie, Dickson KW Chiu, and Kevin KW Ho.
Applied Sciences, 13(4):2250, 2023.

Teaching Experience

Graduate Teaching Assistant
UNIVERSITY OF ILLINOIS CHICAGO, DEPARTMENT OF COMPUTER SCIENCE

Chicago, IL
2024 - now

- CS109 Programming for Engineers with MatLab (Fall 2025)
- CS422: User Interface Design and Programming (Spring 2025)
- CS423: Natural User Interactions (Fall 2024)

Academic Services and Professional Activities

External Reviewer
ACM CONFERENCE

2024 - now

- CHI 2025 Papers
- VRST 2024 Papers **(Outstanding Reviews)**
- CSCW 2024 Posters
- SUI 2024 Papers
- UbiComp/ISWC 2024 Posters and Demos
- UbiComp/ISWC 2024 Workshop on Physiological Methods for HII

Program Committee (PC) member
ACM CONFERENCE

2026

- ACM International Conference on Intelligent User Interfaces (IUI)

Bytedance Technology Frontend Development Training Camp
BYTEDANCE TRAINING CAMP

China
07/2021 - 09/2021

- Studied frontend development with industry experts, understanding the frontier and developing trends.
- Developed a lottery wheel application based on React and Express as the final project.

Google InnoCamp
GOOGLE CHINA UNIVERSITY RELATIONS, BLACKWALNUT LABS, HANGZHOU

China
04/2019 - 04/2020

- Used a cloud platform, Raspberry Pi, and a diverse sensor to transform the public transportation system to realize "Unconscious Pay" and the statistical analysis of passenger flow based on the dual guarantee of WiFi probe and face recognition.