Xiusi Chen

POSTDOCTORAL RESEARCH FELLOW · UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

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Research Interests

- **Large Language Models (LLMs):** Especially low-resource LLM reasoning (*Gotta, MinPrompt, TPD*) and alignment (*IterAlign, RM-R1*).
- **Dynamics Modeling and Decision Making:** Especially planning tasks in the sports, science and finance domain (*ReLiable, PlayBest, DecisionFlow*).
- **AI + X Applications:** Especially in LLM agent tool use, retrieval and recommendation (*CP-LSH, BLaIR, ToolRL, OTC-PO*).

Current Position

University of Illinois Urbana-Champaign   *Urbana, IL, United States*

POSTDOCTORAL RESEARCH FELLOW   *Sept. 2024 - Aug. 2026 (expected)*

- **Faculty Advisor:** Heng Ji

Education

University of California, Los Angeles   *Los Angeles, CA, United States*

PH.D. IN COMPUTER SCIENCE   *Sept. 2018 - Aug. 2024*

- **Thesis Committee:** Wei Wang (Chair, Advisor), Yizhou Sun, Kai-Wei Chang, Jeffrey Brantingham

Peking University   *Beijing, China*

B.S & M.S. IN COMPUTER SCIENCE   *Sept. 2011 - July 2018*

- **Thesis Committee:** Jun Gao, Bin Cui, and Ming Zhang

Selected Publications

Full Publications at Google Scholar: `https://scholar.google.com/citations?user=JqGAil4AAAAJ`

(*: Equal contribution)

RM-R1: Reward Modeling as Reasoning

<u>Xiusi Chen</u>*, Gaotang Li*, Ziqi Wang*, Bowen Jin, Cheng Qian, Yu Wang, Hongru Wang, Yu Zhang, Denghui Zhang, Tong Zhang, Hanghang Tong, Heng Ji

arXiv preprint arXiv: 2505.02387 100+ stars

Beyond Log Likelihood: Probability-Based Objectives for Supervised Fine-Tuning across the Model Capability Continuum

Gaotang Li*, Ruizhong Qiu*, <u>Xiusi Chen</u>*, Heng Ji, Hanghang Tong

arXiv preprint arXiv: 2510.00526

DecisionFlow: Advancing Large Language Model as Principled Decision Maker

<u>Xiusi Chen</u>*, Shanyong Wang*, Cheng Qian*, Hongru Wang*, Peixuan Han, Heng Ji

EMNLP 2025 Findings

MinPrompt: Graph-based Minimal Prompt Data Augmentation for Few-shot Question Answering

<u>Xiusi Chen</u>, Jyun-Yu Jiang, Wei-Cheng Chang, Cho-Jui Hsieh, Hsiang-Fu Yu, Wei Wang

ACL 2024

ITERALIGN: Iterative Constitutional Alignment of Large Language Models

<u>Xiusi Chen</u>, Hongzhi Wen, Sreyashi Nag, Chen Luo, Qingyu Yin, Ruirui Li, Zheng Li, Wei Wang

NAACL 2024

Professional Basketball Player Behavior Synthesis via Planning with Diffusion

<u>Xiusi Chen</u>, Wei-Yao Wang, Ziniu Hu, David Reynoso, Kun Jin, Mingyan Liu, P. Jeffrey Brantingham, Wei Wang

CIKM 2024

A Comprehensive Survey of Scientific Large Language Models and Their Applications in Scientific Discovery

Yu Zhang*, <u>Xiusi Chen</u>*, Bowen Jin*, Sheng Wang, Shuiwang Ji, Wei Wang, Jiawei Han

EMNLP 2024 550+ stars

TinyLLM: Learning a Small Student from Multiple Large Language Models

Yijun Tian*, Yikun Han*, <u>Xiusi Chen</u>*, Wei Wang, Nitech V. Chawla

WSDM 2025

Gotta: Generative Few-shot Question Answering by Prompt-based Cloze Data Augmentation

<u>Xiusi Chen</u>, Yu Zhang, Jinliang Deng, Jyun-Yu Jiang, Wei Wang

SDM 2023 Long Paper, Best Poster Award (Honorable Mention)

ReLiable: Offline Reinforcement Learning for Tactical Strategies in Professional Basketball Games

<u>Xiusi Chen</u>, Jyun-Yu Jiang, Kun Jin, Yichao Zhou, Mingyan Liu, Jefferey Brantingham, Wei Wang

CIKM 2022

Scalable Graph Representation Learning via Locality-Sensitive Hashing

<u>Xiusi Chen</u>, Jyun-Yu Jiang, Wei Wang

CIKM 2022

Large Scale Knowledge Washing

Yu Wang, Ruihan Wu, Zexue He, <u>Xiusi Chen</u>, Julian McAuley

ICLR 2025

Self-Updatable Large Language Models with Parameter Integration

Yu Wang, Xinshuang Liu, <u>Xiusi Chen</u>, Sean O'Brien, Junda Wu, Julian McAuley

ICLR 2025

Strategist: Learning Strategic Skills by LLMs via Bi-Level Tree Search

Jonathan Light, Min Cai, Weiqin Chen, Guanzhi Wang, <u>Xiusi Chen</u>, Wei Cheng, Yisong Yue, Ziniu Hu

ICLR 2025

MemoryLLM: Toward Self-Updating Large Language Models

Yu Wang, Yifan Gao, <u>Xiusi Chen</u>, Haoming Jiang, Shiyang Li, Jingfeng Yang, Qingyu Yin, Zheng Li, Xian Li, Bing Yin, Jingbo Shang, Julian McAuley

ICML 2024

Language Models as Semantic Indexers

Bowen Jin, Hansi Zeng, Guoyin Wang, <u>Xiusi Chen</u>, Tianxin Wei, Ruirui Li, Zhengyang Wang, Zheng Li, Yang Li, Hanqing Lu, Suhang Wang, Jiawei Han, Xianfeng Tang

ICML 2024

Weakly Supervised Multi-Label Classification of Full-Text Scientific Papers

Yu Zhang, Bowen Jin, <u>Xiusi Chen</u>, Yanzhen Shen, Yunyi Zhang, Yu Meng, Jiawei Han

KDD 2023

EscapeBench: Pushing Language Models to Think Outside the Box

Cheng Qian, Peixuan Han, Qinyu Luo, Bingxiang He, <u>Xiusi Chen</u>, Yuji Zhang, Hongyi Du, Jiarui Yao, Xiaocheng Yang, Denghui Zhang, Yunzhu Li, Heng Ji

ACL, 2025

SMART: Self-Aware Agent for Tool Overuse Mitigation

Cheng Qian, Emre Can Acikgoz, Hongru Wang, <u>Xiusi Chen</u>, Avirup Sil, Dilek Hakkani-Tür, Gokhan Tur, Heng Ji

ACL Findings, 2025

ToolRL: Reward is All Tool Learning Needs

Cheng Qian, Emre Can Acikgoz, Qi He, Hongru Wang, **Xiusi Chen**, Dilek Hakkani-Tür, Gokhan Tur, Heng Ji

NeurIPS, 2025

Honors & Awards

ACADEMIC AWARDS

2023	**Best Poster Award (Honorable Mention),** SIAM International Conference on Data Mining (SDM)
2023	**SIAM Student Travel Award,** SIAM
2022	**Student Travel Grant,** ACM SIGIR
2021	**Student Travel Grant,** ACM SIGIR
2016	**Leo KoGuan Fellowship (Top 2%),** Peking University
2016	**Merit Student (Top 5%),** Peking University
2015–2017	**Graduate Student Academic Fellowship (3-time Recipient),** Peking University

ATHLETIC RECOGNITION

2014	**3rd Place, Beijing Division,** 17th Chinese University Basketball Association (CUBA) Championships
2010	**6th Place, 100M Breaststroke,** High School Students Swimming Contest of Hunan Province

Tutorials & Talks

Seminar Talk — *Northeastern University*
TOWARDS AGENTIC REASONING AND ALIGNMENT OF LARGE LANGUAGE MODELS — *Nov. 2025*

Invited Talk — *ByteDance Seed Research*
POST-TRAINING DATA AND ALGORITHMS FOR LLM AGENTS — *Sept. 2025*

Conference Tutorial — *NAACL 2025*
LLMS AND COPYRIGHT RISKS: BENCHMARKS AND MITIGATION APPROACHES — *May. 2025*

Invited Talk — *UIUC-NLP Seminar*
DATA-CENTRIC KNOWLEDGE-ENHANCED REASONING AND ALIGNMENT OF LARGE LANGUAGE MODELS — *Nov. 2024*

Invited Talk — *UCSD CSE Seminar*
DATA-CENTRIC KNOWLEDGE-ENHANCED REASONING AND ALIGNMENT OF LARGE LANGUAGE MODELS — *Jul. 2024*

Academic Service

Workshop Organizer
- Structured Knowledge for Large Language Models (Sknow-LLM) Workshop at KDD 2025.

Area Chair
- ACL Rolling Review.

Conference Program Committee
- KDD (2020–2024), WSDM (2022–2024), WWW (2024), SSL@WWW (2021), ICML (2023–2024), NeurIPS (2022–2024), ICLR (2022–2024), AAAI (2021–2024), IJCAI-ECAI (2022–2024).

Journal Reviewer
- IEEE Transactions on Big Data (TBD), IEEE Transactions on Knowledge and Data Engineering (TKDE).

Student Volunteer
- KDD (2020, 2023).

Industrial Experiences

Amazon AI
APPLIED SCIENTIST INTERN — QUERY UNDERSTANDING TEAM — *June 2023 – Dec. 2023*

Amazon AI
APPLIED SCIENTIST INTERN — PECOS TEAM — *June 2022 – Sept. 2022*

NEC Laboratories America — Data Science & System Security
RESEARCH INTERN — *June 2019 – Sept. 2019*

Alibaba — DAMO Academy
RESEARCH INTERN — *July 2016 – Dec. 2016*

Teaching Experience

CS 245: Big Data Analysis   *University of California, Los Angeles*
Teaching Associate   *Fall 2020*

CS 143: Database Systems   *University of California, Los Angeles*
Teaching Assistant   *Spring 2020*

CS 31: Introduction to Computer Science   *University of California, Los Angeles*
Teaching Assistant   *Fall 2019, Winter 2020*

Introduction to Database Systems (Honor Track)   *Peking University*
Teaching Assistant   *Spring 2016*

Database Systems Principles and Technologies   *Peking University*
Teaching Assistant   *Fall 2016*

Mentoring Experience

UIUC

2025   **Hongru Wang**, LLM Tool Use, Chinese University of Hong Kong
2024-Now **Cheng Qian**, LLM Tool Use, UIUC PhD Student
2024-Now **Gaotang Li**, LLM Alignment, UMich undergrad → UIUC PhD Student
2024-2025 **Shanyong Wang**, LLM for Decision Making, ShanghaiTech undergrad
2024-2025 **Xuehang Guo**, LLM Agent Memory, University of Pittsburgh → William & Mary PhD

UCLA

2023   **David Reynoso**, Diffusion Model for Decision Making, UCLA undergrad → UCLA MS