Introduction

Pengyang Shao received his Ph.D. degree in July 2025 from Hefei University of Technology under the supervision of Prof. Meng Wang. As a Ph.D. candidate, his research interests were related to information retrieval, including recommender systems and cognitive diagnosis. He is currently a visiting scholar at NExT++ Lab, NUS, under the supervision of Prof. Tat Seng Chua, focusing on LLM unlearning/safety.

Google Scholar Github Page

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Research Summary

1) **LLM Unlearning**: Developing better LLM unlearning, including (i) a DRO-theoretic framework for balanced LLM unlearning (WWW 26) and (ii) a principled analysis of current forget losses for knowledge unlearning beyond input–output disassociation.
2) **Fairness & Privacy for Recommender Systems (RS)**: Studying statistical fairness based on adversarial learning; counterfactual user-side fairness based on potential outcome frameworks, and privacy attacks that make user preferences unlearnable.
3) **Cognitive Diagnosis (CD)**: Improving graph-based CD via information bottleneck principles and designing LLM based agents for BFS-driven concept augmentation to enhance CD under sparse concept descriptions.

First-Author & Corresponding-Author Publications

*** denotes the corresponding author. For your convenience, I have attached the proofs and texts of papers that are not yet searchable online, including the KDD 2026 paper, WWW 2026 paper, and a collection of manuscripts currently under review.**

Accepted:

- **Pengyang Shao**, Naixin Zhai, et al. BalDRO: A Distributionally Robust Optimization based Framework for Large Language Model Unlearning. WWW 2026, just accepted.
- **Pengyang Shao**, Lei Chen, et al. Multi-Agent Debate based Concept Augmentation for Enhanced Cognitive Diagnosis. KDD 2026 August Cycle, just accepted.
- Jilong Liu, **Pengyang Shao***, et al. Debate over Mixed-knowledge: A Robust Multi-Agent Framework for Incomplete Knowledge Graph Question Answering. AAAI 2026.
- **Pengyang Shao**, Yonghui Yang, et al. Exploring Heterogeneity and Uncertainty for Graph-based Cognitive Diagnosis Models in Intelligent Education. KDD 2025.
- **Pengyang Shao**, Le Wu, et al. Average User-side Counterfactual Fairness for Collaborative Filtering. ACM TOIS, 2024.
- **Pengyang Shao**, Le Wu, et al. FairCF: Fairness-aware collaborative filtering. Science China Information Sciences (SCIS), 2022.

- **Pengyang Shao**, Zihan Wang, et al. Towards Reliable Cross-Domain Recommendation: A Disentangled Global Graph Learning based Framework. Frontiers of Computer Science (FCS), 2025.
- **Pengyang Shao**, Chen Gao, et al. Breaking student-concept sparsity barrier for cognitive diagnosis. Frontiers of Computer Science (FCS), 2025.

Under Review:

- **Pengyang Shao**, Le Wu, et al. Privacy Matters: Data Attack for Unlearnable User Preference in Recommendation. Under review at ACM TOIS. (Minor revisions)
- Chao Chen, **Pengyang Shao***, et al. Enhancing Cold-Start Personalization for Large Language Models with Social Information. Under review at ACL 2026.
- Naixin Zhai, **Pengyang Shao***, et al. Maximizing Local Entropy Where It Matters: Prefix-Aware Localized LLM Unlearning. Under review at ACL 2026.

Experiences

1)	National University of Singapore Advisor:	Visiting Tat Seng Chua	2025.08-Present Singapore
2)	Hefei University of Technology Advisor:	Ph.D. Meng Wang	2019.09 – 2025.06 Hefei, China
3)	Tsinghua University - FIB Co-Advisor:	Intern Yong Li	2023.08 - 2024.03 Beijing, China

Academic Services

Journal/Conference Reviewer: IEEE TKDE, ACM ToRS/TOIS, IJCAI 2024, KDD 2024/2025/2026, WWW 2024/2026, AAAI 2026 et al.

Academic Mentorship

(1) Leading **Zhiyuan Han (USTC, PhD candidate)** on a GUI Agent research project in Beijing, providing core ideas, technical guidance.

(2) Mentoring **Jilong Liu (HFUT, PhD candidate)** toward an AAAI 2026 publication, contributing to problem formulation, method design, and paper writing.

(3) Mentoring **Chao Chen (HFUT, Master's student)** and **Naixin Zhai (USTC, Master's student)** to complete two ACL 2026 submissions, providing end-to-end guidance from methodology development to manuscript revision.

Awards

- China Association for Science and Technology (CAST) Young Talent Support Program (PhD Special Track) 2024
- First-Class Graduate Academic Scholarship (awarded annually) 2021-2024

- Outstanding Graduate of Anhui Province 2019