Huanxuan Liao

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Education

Institute of Automation, Chinese Academy of Sciences (CASIA) 2023 – Present
PhD student in Pattern Recognition and Intelligent Systems (NLPR). Advisors: Shizhu He and Kang Liu.

North China Electric Power University (NCEPU) 2019 – 2023
Bachelor of Engineering in Intelligence Science and Technology (Innovation Class). Rank: **1/13**.

Research Interests

My research focuses on **foundation model pretraining and mid-training**. My long-term goal is to build models that can retain knowledge, transfer skills, and learn over extended interactions.

Data and Model Co-Design. I examine how synthetic supervision, data mixtures, and architecture shape capability acquisition. My work spans verifiable synthesis (LongWorld), efficient context modeling (LUSA, HyCo_2, SparK), and adaptive visual input allocation (ResAdapt, AllocEmbed). I aim to validate training gains across a **scaling ladder** of model sizes and token budgets.

Adaptation. I work on *continual adaptation* through instruction-conditioned transfer (TAGI, SHIP), parametric knowledge adaptation (DyPRAG), and rehearsal-free learning (SpaRTA). My work on *agent learning* spans tool use (CITI, Tool-RL-Box), reuse of experience (KATE), and policy improvement (BuPO, Distill Yourself), alongside evaluation in interactive tasks (OPERATE).

Selected Publications

Full publication list: personal homepage.

Data and Model Co-Design

[13] **[ACM TOIS'26]** Huanxuan Liao, Yao Xu, Shizhu He, Jun Zhao, and Kang Liu. "HyCo_2: Hybrid Context Compression with Global Semantics and Local Evidence".

[12] **[arXiv'26]** Huanxuan Liao, Zhongtao Jiang, Yupu Hao, Yuqiao Tan, Shizhu He, Ben Wang, Jun Zhao, Kun Xu, and Kang Liu. "ResAdapt: Adaptive Resolution for Efficient Multimodal Reasoning".

[11] **[arXiv'26]** Song Jin, Zhongtao Jiang, Chenglei Shen, Huanxuan Liao, Haozhe Chi, Zhiwei Wang, Kun Xu, and Yong Liu. "Allocate Before You Embed: Adaptive Visual Input Allocation for Video Embeddings".

[10] **[AAAI'26]** Huanxuan Liao, Yixing Xu, Shizhu He, Guanchen Li, Xuanwu Yin, Dong Li, Emad Barsoum, Jun Zhao, and Kang Liu. "SparK: Query-Aware Unstructured Sparsity with Recoverable KV Cache Channel Pruning".

[9] **[arXiv'25]** Jiaheng Liu, Dawei Zhu, Zhiqi Bai, Yancheng He, Huanxuan Liao, et al. "A Comprehensive Survey on Long Context Language Modeling". *Core contributor to the survey.*
Awesome-LCLM: **Curator & Maintainer**.

Continual Adaptation

[8] **[ACL'26]** Huanxuan Liao, Shizhu He, Yupu Hao, Yequan Wang, Wenhao Teng, Xiangwen Liao, Jun Zhao, and Kang Liu. "Spectral Disentanglement: Rank-Aware Task Adaptation for Rehearsal-free Continual Learning in LLMs".

[7] **[AAAI'25]** Huanxuan Liao, Shizhu He, Yao Xu, Yuanzhe Zhang, Kang Liu, and Jun Zhao. "Neural-Symbolic Collaborative Distillation: Advancing Small Language Models for Complex Reasoning Tasks".

[6] **[COLING'25]** Huanxuan Liao, Shizhu He, Yupu Hao, Xiang Li, Yuanzhe Zhang, Jun Zhao, and Kang Liu. "SKIntern: Internalizing Symbolic Knowledge for Distilling Better CoT Capabilities into Small Language Models".

[5] **[COLING'25]** Huanxuan Liao, Shizhu He, Yao Xu, Yuanzhe Zhang, Shengping Liu, Kang Liu, and Jun Zhao. "Awakening Augmented Generation: Learning to Awaken Internal Knowledge of Large Language Models for Question Answering".

[4] **[NeurIPS'24]** Huanxuan Liao, Shizhu He, Yao Xu, Yuanzhe Zhang, Yanchao Hao, Shengping Liu, Kang Liu, and Jun Zhao. "From Instance Training to Instruction Learning: Task Adapters Generation from Instructions".

Agent Learning

[3] **[EMNLP'26]** Yuqiao Tan, Minzheng Wang, Shizhu He, Huanxuan Liao, Chengfeng Zhao, Qiunan Lu, Tian Liang, Jun Zhao, and Kang Liu. "Bottom-up Policy Optimization: Your Language Model Policy Secretly Contains Internal Policies". **Oral.**

[2] **[ACL'26]** Yupu Hao, Zhuoran Jin, Huanxuan Liao, Kang Liu, and Jun Zhao. "Pushing the Limits of LLM Tool Calling via Experiential Knowledge Integration and Activation". *Findings*.

[1] **[ACL'25]** Yupu Hao, Pengfei Cao, Zhuoran Jin, Huanxuan Liao, Yubo Chen, Kang Liu, and Jun Zhao. "Evaluating Personalized Tool-Augmented LLMs from the Perspectives of Personalization and Proactivity".

Selected Awards

- **CAST Young Science and Technology Talent Cultivation Program** (Doctoral Student Special Plan). 2026
- **National Scholarship** (three awards). 2021 / 2022 / 2025
- **Beijing Outstanding Graduate**. Jun. 2023

Academic Service

Conference Reviewer: ACL ARR 2024–2026; NeurIPS 2025–2026; ICML 2026; COLM 2026; ICLR 2025–2026; AAAI 2026.

Open Source: Awesome-LCLM: **Curator & Maintainer**; NVIDIA/kvpress: Contributor; Distill Yourself: Core Logic & Code Contributor.