

Chuang Ma

Ph.D. Candidate, Graduate School of Informatics, Kyoto University
Research Assistant, LLMC, National Institute of Informatics
Kyoto, Japan · ma.chuang.52h@st.kyoto-u.ac.jp · chuang_ma@nii.ac.jp

RESEARCH AREAS

Deep learning theory; LLM / MLLM mechanistic interpretability; MLLM pretraining; LLM post-training.

SKILLS

- Large-scale training and inference:** extensive hands-on experience with distributed LLM training and large-scale inference on up to ~1,000 GPUs, using Megatron-LM, vLLM, verl and PyTorch/NCCL.
- Clusters and scheduling:** proficient with Slurm and PBS, with 3+ years of coordinating and managing shared GPU allocations across several concurrent research projects.
- Theory:** 5+ years of deep learning theory via unconstrained feature models: neural collapse and feature geometry.
- Tools and working style:** experienced user of frontier commercial AI models and agentic coding tools; highly motivated, energetic and collaborative.

EDUCATION

-  **Doctor of Informatics (Ph.D.),** Kyoto University Apr. 2024 – Present
Major in artificial intelligence. Mathematical Information Systems Group, Graduate School of Informatics. Advisors: Prof. Toshiyuki Tanaka and Prof. Tomoyuki Obuchi.
-  **Master of Informatics,** Kyoto University Apr. 2022 – Mar. 2024
Same group and advisors as the doctoral program.
-  **Bachelor of Engineering in Software Engineering,** Dalian University of Technology Sep. 2017 – Sep. 2021
Dual degree: Bachelor of Science in Information Science, Ritsumeikan University (Oct. 2019 – Sep. 2021). Advisor: Prof. Tadahiro Taniguchi.

RESEARCH EXPERIENCE

-  **Research Collaborator,** Science of Fundamental AI Research (SOFAIR) Lab and NVIDIA Aug. 2026 – Present
SOFAIR is led by UCL with the University of Oxford, the University of Cambridge and the University of Edinburgh. Multilingual and multimodal pretraining toward a 9B-parameter model trained on fully license-compliant data, to be released fully open source.
-  **Research Assistant,** Research and Development Center for Large Language Models (LLMC), National Institute of Informatics May 2025 – Present
Interpretability and explainability of multimodal large language models, with Dr. Qianying Liu and Prof. Akiko Aizawa.
-  **Research Assistant,** Graduate School of Informatics, Kyoto University Aug. 2022 – Present
 Numerical experiments and research support in the KAKENHI project "Statistical Mechanical Approaches to High-Dimensional Machine Learning."
-  **Server administrator,** Mathematical Information Systems Group, Kyoto University Apr. 2024 – Present

PUBLICATIONS

* Equal contribution.

CONFERENCE PAPERS

- Neural Collapse in Cumulative Link Models for Ordinal Regression: An Analysis with Unconstrained Feature Model.** Chuang Ma, Tomoyuki Obuchi, Toshiyuki Tanaka. *Advances in Neural Information Processing Systems (NeurIPS)*, 2025. Poster. arXiv:2506.05801.
- Mechanistic Diagnostics of Spatial Lexical Bias in Multimodal Large Language Model Spatial Reasoning.** Chuang Ma, Qianying Liu, Tomoyuki Obuchi, Fei Cheng, Wang Yang, Sudong Cai, Shuyuan Zheng, Akiko Aizawa, Sadao Kurohashi. *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2026. Main conference, to appear. arXiv:2606.01914.
- Path-Lock Expert: Separating Reasoning Mode in Hybrid Thinking via Architecture-Level Separation.** Shouren Wang*, Wang Yang*, Chuang Ma, Debargha Ganguly, Vikash Singh, Chaoda Song, Xinpeng Li, Xianxuan Long, Vipin Chaudhary, Xiaotian Han. *Conference on Language Modeling (COLM)*, 2026. Poster. arXiv:2604.27201.

PREPRINTS AND PAPERS UNDER REVIEW

4. **Understanding Head Geometry and Dynamics in Federated Regression through a Natural Solution Selection Rule: An Unconstrained Feature Model Analysis.** Chuang Ma, Tomoyuki Obuchi. arXiv:2609.39464, 2026.
5. **How to Loop MoE: Flatten the Experts, Untie the Attention.** Shouren Wang*, Chuang Ma*, Mohsen Hariri, Debargha Ganguly, Wang Yang, Xiaoqing Tong, Qianying Liu, Xiaotian Han, Vipin Chaudhary. arXiv:2609.35751, 2026.
6. **A Survey on Agent Skills for LLMs: A Lifecycle Perspective from Construction to Ecosystems.** Wang Yang, Chaoda Song, Xinpeng Li, Shouren Wang, Nengbo Wang, Yanyan Zhang, Chuang Ma, Debargha Ganguly, Vikash Singh, Shuai Xu, Jing Ma, Yu Yin, Vipin Chaudhary, Xiaotian Han. SSRN preprint 6746498, 2026.
7. **AgentCE-Bench: Agent Configurable Evaluation with Scalable Horizons and Controllable Difficulty under Lightweight Environments.** Wang Yang, Chaoda Song, Xinpeng Li, Debargha Ganguly, Chuang Ma, Shouren Wang, Zhihao Dou, Yuli Zhou, Vipin Chaudhary, Xiaotian Han. arXiv:2604.06111, 2026.
8. **When Domains Interact: Asymmetric and Order-Sensitive Cross-Domain Effects in Reinforcement Learning for Reasoning.** Wang Yang, Shouren Wang, Chaoda Song, Chuang Ma, Xinpeng Li, Nengbo Wang, Kaixiong Zhou, Vipin Chaudhary, Xiaotian Han. arXiv:2602.01365, 2026.
9. **JMO: A Benchmark for Mathematical Reasoning on Japanese Olympiad Problems.** Qianying Liu, Chuang Ma, Chaoran Liu, Fei Cheng, Sadao Kurohashi. Under review, 2026. Workshop version presented at the MathNLP Workshop, EMNLP 2025.

TALKS AND PRESENTATIONS

Poster, 2nd Japanese Symposium on Open Large Language Models, National Institute of Informatics, Tokyo, Japan (upcoming)	Nov. 2026
Poster, <i>Mechanistic Diagnostics of Spatial Lexical Bias in Multimodal Large Language Model Spatial Reasoning</i> , EMNLP 2026, Budapest, Hungary (upcoming)	Oct. 2026
Poster, <i>Path-Lock Expert: Separating Reasoning Mode in Hybrid Thinking via Architecture-Level Separation</i> , COLM 2026, San Francisco, USA (upcoming)	Oct. 2026
Poster, <i>Neural Collapse in Cumulative Link Models for Ordinal Regression</i> , NeurIPS 2025, San Diego, USA	Dec. 2025
Oral, <i>JMO: A Benchmark for Mathematical Reasoning on Japanese Olympiad Problems</i> (with Qianying Liu et al.), MathNLP Workshop, EMNLP 2025	Nov. 2025
Oral, <i>Neural Collapse in Cumulative Link Models for Ordinal Regression</i> , The 80th Annual Meeting of the Physical Society of Japan, Hiroshima, Japan	Sep. 2025
Poster, <i>Exploring Collapse Phenomena in the Feature Space of Overparameterized Neural Networks for Imbalanced Regression through Unconstrained Feature Model</i> , The 27th Information-Based Induction Sciences Workshop (IBIS 2024), Saitama, Japan	Nov. 2024

AWARDS AND SCHOLARSHIPS

Liaoning Province Outstanding Graduate	2021
Saionji Memorial Scholarship, Ritsumeikan University (Academically Outstanding Students Category)	2020
Chinese National Scholarship	2018

ACADEMIC SERVICE

Reviewer, International Conference on Learning Representations (ICLR 2027) (upcoming)	2026
Reviewer, Advances in Neural Information Processing Systems (NeurIPS 2025 and NeurIPS 2026)	2025 – 2026
Reviewer, ACL Rolling Review, May 2026 cycle (EMNLP 2026 / AACL-IJCNLP 2026) and October 2026 cycle (NAACL 2027 / COLING 2027, upcoming)	2026
Reviewer, IEEE Transactions on Neural Networks and Learning Systems (TNNLS), three manuscripts completed and one in progress	2026

LANGUAGES

Chinese (native), English, Japanese.