

Xintong Li

PH.D. STUDENT @ CS, UC, SAN DIEGO

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RESEARCH INTERESTS

LLM Reasoning • Multimodal • Weak Supervision

My research focuses on efficient machine learning, with particular interest in reasoning, multimodal, and weak supervision. I primarily focus on enhancing reasoning abilities of LLMs and multimodals through reinforcement learning, aiming for efficient training and inference on complex reasoning tasks. My recent work explores balancing different modalities in multimodal instruction tuning to mitigate hallucination and catastrophic forgetting. I am always eager to broaden the scope of machine learning methods toward under-studied application fields.

EDUCATION

University of California, San Diego

PH.D. IN COMPUTER SCIENCE

Sep 2023 - Present

Advised by Prof. Jingbo Shang;

University of Wisconsin, Madison

B.S. IN COMPUTER SCIENCE & DATA SCIENCE;

Sep 2019 - May 2023

Distinctive Scholastic Achievement; **GPA: 3.94/4**

PROFESSIONAL EXPERIENCE

Amazon, Rufus

Seattle, WA, USA

APPLIED SCIENTIST INTERN

Jun 2025 - Sep 2025

- Proposed a group relative policy optimization framework with dynamic rollouts to optimize chain-of-thought reasoning.
- Introduced a step-level reward function balancing informativeness and verbosity to improve reasoning accuracy and efficiency.

Amazon, Alexa AI

Seattle, WA, USA

APPLIED SCIENTIST INTERN

Jun 2024 - Sep 2024

- Designed a multi-session conversation dataset with implicit reasoning to address complex QA tasks.
- Developed a memory-augmented framework that integrates all conversation history to enhance model persona and response accuracy.

University of California, San Diego

San Diego, CA, USA

GRADUATE STUDENT RESEARCHER (Advisor: Prof. Jingbo Shang)

Sep 2023 - Present

- Conducted research on efficient machine learning, including weak supervision, multimodal LLMs, and reinforcement learning.

University of Wisconsin, Madison

Madison, WI, USA

UNDERGRADUATE RESEARCH ASSISTANT (Advisor: Prof. Jelena Diakonikolas)

Feb 2022 - May 2023

- Used potential function-based framework to study the convergence of adaptive gradient descent methods.
- Extended to non-convex and local smoothness case to search for better convergence rates.

University of Wisconsin, Madison

Madison, WI, USA

UNDERGRADUATE RESEARCH ASSISTANT (Advisor: Prof. Frederic Sala)

Dec 2020 - May 2023

- Implemented plug-and-play combinations of feature representations and automatic label function generation and selection framework.
- Incorporated the geometric relationship of label spaces in order to learn in partially observed label spaces of extremely high cardinality.

PAPERS & PRE-PRINTS

* Equal Contribution

- [13] MISP-DPO: Importance Sampling for Multi-Negative Multimodal Direct Preference Optimization
Xintong Li, Chuhan Wang, Junda Wu, Rohan Surana, Tong Yu, Julian McAuley, Jingbo Shang
Preprint. [arXiv:2509.25717](https://arxiv.org/abs/2509.25717)

- [12] Toward Multi-Session Personalized Conversation: A Large-Scale Dataset and Hierarchical Tree Framework for Implicit Reasoning
Xintong Li, Jalend Bantupalli, Ria Dharmani, Yuwei Zhang, Jingbo Shang
Conference on Empirical Methods in Natural Language Processing (EMNLP), 2025. **Oral**
- [11] CoMMIT: Coordinated Multimodal Instruction Tuning
Xintong Li*, Junda Wu*, Tong Yu, Rui Wang, Yu Wang, Xiang Chen, Jiuxiang Gu, Lina Yao, Julian McAuley, Jingbo Shang
Conference on Empirical Methods in Natural Language Processing (EMNLP), 2025.
- [10] Explainable Chain-of-Thought Reasoning: An Empirical Analysis on State-Aware Reasoning Dynamics
Sheldon Yu*, Yuxin Xiong*, Junda Wu, Xintong Li, Tong Yu, Xiang Chen, Ritwik Sinha, Jingbo Shang, Julian McAuley
Conference on Empirical Methods in Natural Language Processing (EMNLP) (Findings), 2025.
- [9] Mitigating Visual Knowledge Forgetting in MLLM Instruction-tuning via Modality-decoupled Gradient Descent
Junda Wu, Yuxin Xiong, Xintong Li, Yu Xia, Yu Wang, Tong Yu, Sungchul Kim, Ryan A. Rossi, Lina Yao, Jingbo Shang, Julian McAuley
Conference on Empirical Methods in Natural Language Processing (EMNLP) (Findings), 2025.
- [8] A Survey on Personalized and Pluralistic Preference Alignment in Large Language Models
Zhouhang Xie, Junda Wu, Yiran Shen, Yu Xia, Xintong Li, Aaron Chang, Ryan Rossi, Sachin Kumar, Bodhisattwa Prasad Majumder, Jingbo Shang, Prithviraj Ammanabrolu, Julian McAuley
Conference on Language Modeling (COLM), 2025.
- [7] From Selection to Generation: A Survey of LLM-based Active Learning
Yu Xia, Subhojyoti Mukherjee, Zhouhang Xie, Junda Wu, Xintong Li, Ryan Aponte, Hanjia Lyu, Joe Barrow, Hongjie Chen, Franck Dernoncourt, Branislav Kveton, Tong Yu, Ruiyi Zhang, Jiuxiang Gu, Nesreen K. Ahmed, Yu Wang, Xiang Chen, Hanieh Deilamsalehy, Sungchul Kim, Zhengmian Hu, Yue Zhao, Nedim Lipka, Seunghyun Yoon, Ting-Hao Kenneth Huang, Zichao Wang, Puneet Mathur, Soumyabrata Pal, Koyel Mukherjee, Zhehao Zhang, Namyong Park, Thien Huu Nguyen, Jiebo Luo, Ryan A. Rossi, Julian McAuley
The 63rd Annual Meeting of the Association for Computational Linguistics (ACL), 2025.
- [6] GUI Agents: A Survey
Dang Nguyen, Jian Chen, Yu Wang, Gang Wu, Namyong Park, Zhengmian Hu, Hanjia Lyu, Junda Wu, Ryan Aponte, Yu Xia, Xintong Li, Jing Shi, Hongjie Chen, Viet Dac Lai, Zhouhang Xie, Sungchul Kim, Ruiyi Zhang, Tong Yu, Mehrab Tanjim, Nesreen K. Ahmed, Puneet Mathur, Seunghyun Yoon, Lina Yao, Branislav Kveton, Jihyung Kil, Thien Huu Nguyen, Trung Bui, Tianyi Zhou, Ryan A. Rossi, Franck Dernoncourt
The 63rd Annual Meeting of the Association for Computational Linguistics (ACL) (Findings), 2025.
- [5] OCEAN: Offline Chain-of-thought Evaluation and Alignment in Large Language Models
Junda Wu*, Xintong Li*, Ruoyu Wang, Yu Xia, Yuxin Xiong, Jianing Wang, Tong Yu, Xiang Chen, Branislav Kveton, Lina Yao, Jingbo Shang, Julian McAuley
The International Conference on Learning Representations (ICLR), 2025.
- [4] Visual Prompting in Multimodal Large Language Models: A Survey
Junda Wu, Zhehao Zhang, Yu Xia, Xintong Li, Zhaoyang Xia, Aaron Chang, Tong Yu, Sungchul Kim, Ryan A Rossi, Ruiyi Zhang, Subrata Mitra, Dimitris N Metaxas, Lina Yao, Jingbo Shang, Julian McAuley
Preprint. arXiv:2409.15310
- [3] Open-world Multi-label Text Classification with Extremely Weak Supervision
Xintong Li, Jinya Jiang, Jayanth Srinivasa, Gaowen Liu, Jingbo Shang
Conference on Empirical Methods in Natural Language Processing (EMNLP), 2024.
- [2] Geometry-Aware Adaptation for Pretrained Models
Nicholas Roberts, Xintong Li, Dyah Adila, Sonia Cromp, Tzu-Heng Huang, Jitian Zhao, Frederic Sala
Conference on Neural Information Processing Systems (NeurIPS), 2023.
- [1] AutoWS-Bench-101: Benchmarking Automated Weak Supervision with 100 Labels
Nicholas Roberts*, Xintong Li*, Tzu-Heng Huang, Dyah Adila, Spencer Schoenberg, Cheng-Yu Liu, Lauren Pick, Haotian Ma, Aws Albarghouthi, Frederic Sala

Conference on Neural Information Processing Systems(**NeurIPS**), 2022.

SELECTED HONORS & AWARDS

2023-2024 UCSD Jacob School of Engineering Fellowship
2022 NeurIPS Scholar Award
2022 Wisconsin Science and Computing Emerging Research Stars (exploreCSR award)
2020-2022 UW–Madison Dean’s List

LEADERSHIP & ACTIVITIES

Team Member

DATA SCIENCE RESEARCH GROUP

UW-Madison

2021–2023

Team Member

UW-MADISON SOCIETY OF WOMEN ENGINEERS

UW-Madison

2021 – 2022

Team Member

UNIVERSITY HOUSING

UW-Madison

2020

SERVICE & TECHNICAL SKILLS

Reviewer: NeurIPS (2024, 2025), ICLR (2025, 2026), AISTATS (2025), EMNLP (2025), ACL(2025)

Coursework: Machine Learning, Deep Learning, Nonlinear Optimization, Algorithm, Natural Language Processing, Web Mining and Recommender Systems, Probabilistic Reason and Learning

Tools: Python, Java, C, C++, R, Pytorch, TensorFlow, SQL, JavaScript, Docker