Jiayu (Mila) Wang

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EDUCATION

University of Wisconsin-Madison **Jun 2024 – Aug 2026/Dec 2026**
Ph.D. in Computer Sciences | GPA: 4.00 | Advisors: Aws Albarghouthi, Fred Sala *Madison, WI, USA*

University of Wisconsin-Madison **Aug 2022 – May 2024**
Master of Science in Economics | GPA: 3.95 *Madison, WI, USA*

Peking University **Sept 2018 – July 2021**
Bachelor of Economics *Beijing, China*

Beijing Foreign Studies University **Sept 2017 – Jun 2021**
Bachelor of Arts *Beijing, China*

RESEARCH INTERESTS

Large Language Model, Self-evolving Agents, Agentic and Multi-agent System, Efficiency, Multimodality

PUBLICATIONS

Beyond Accuracy: Dissecting Mathematical Reasoning for LLMs Under Reinforcement Learning [Paper] [Code]
Jiayu Wang, Yifei Ming, Zixuan Ke, Caiming Xiong, Shafiq Joty, Aws Albarghouthi, Fred Sala
Neural Information Processing Systems (NeurIPS), 2025

Is A Picture Worth A Thousand Words? Delving Into Spatial Reasoning for Vision Language Models [Paper] [Code]
Jiayu Wang, Yifei Ming, Zhenmei Shi, Vibhav Vineet, Xin Wang, Neel Joshi
Neural Information Processing Systems (NeurIPS), 2024

Grammar-Aligned Decoding [Paper] [Code]
Jiayu Wang*, Kanghee Park*, Taylor Berg-Kirkpatrick, Nadia Polikarpova, Loris D'Antoni
Neural Information Processing Systems (NeurIPS), 2024

LiveResearchBench: A Live Benchmark for User-Centric Deep Research in the Wild [Paper] [Code]
Jiayu Wang, Yifei Ming, Riya Dulepet, Qinglin Chen, Austin Xu, Zixuan Ke, Frederic Sala, Aws Albarghouthi, Caiming Xiong, Shafiq Joty
preprint, 2025

COSMOS: Are Performance–Cost Tradeoffs Predictable in Model–Strategy Selection? [Paper] [Code]
Jiayu Wang, Aws Albarghouthi, Fred Sala
preprint, 2025

Synthesizing Agentic Data for Web Agent Training with Progressive Difficulty Enhancement
Shrey Pandit, Xuan-Phi Nguyen, Yifei Ming, Austin Xu, **Jiayu Wang**, Caiming Xiong, Shafiq Joty
preprint, 2025

Helpful Agent Meets Deceptive Judge: Understanding Vulnerabilities in Agentic Workflows [Paper] [Code]
Yifei Ming, Zixuan Ke, Xuan-Phi Nguyen, **Jiayu Wang**, Shafiq Joty
preprint, 2025

PROJECTS

Multi-agent System for Deep Research **Jun 2025 – present**
Advisor: Shafiq Joty

- Developed a multi-agent research system with memory, planning, and tool-integration modules, achieving SoTA performance on DeepResearch Bench.
- Designed a new evaluation framework and benchmark for diverse deep research tasks in enterprise, featuring checklist-based evaluation and a citation-traced statement quality metric.

Dissecting Mathematical Reasoning of LLMs under Reinforcement Learning **Feb 2025 – May 2025**
Advisor: Aws Albarghouthi, Fred Sala

- Conducted systematic analysis of Large Language Models' mathematical reasoning capabilities, examining the distinct effects of reinforcement learning on knowledge acquisition versus reasoning processes through top-down and sequential evaluation frameworks.

Efficient Language Model–Strategy Routing System **May 2024 – Jan 2025**

Advisor: Aws Albarghouthi, Fred Sala

- Proposed a novel dynamic LLM routing system for underrepresented domains, capable of incorporating fine-tuning and prompting to the routing system.
- First to demonstrate that dynamic updates are predictable and further designed a framework that accurately estimates the performance gains and costs of fine-tuning and prompting before incurring actual expenses.
- Constructed a holistic benchmark to assess the domain transfer capabilities of competitive language model routing systems.

Delving into Spatial Reasoning for Vision-Language Models **Jan 2024 – May 2024**

Advisor: Neel Joshi, Vibhav Vineet

- Developed a multi-task benchmark to evaluate the spatial reasoning abilities of multi-modal models.
- Conducted a systematic and comprehensive evaluation of competitive vision-language models and pure language models and revealed new insights on the impact of input modalities, model scale and model modalities.

Grammar-Aligned Decoding with Large Language Models **Jan 2024 – May 2024**

Advisor: Loris D'Antoni

- Established a new problem setting where pre-trained language models are constrained to follow formal specifications while preserving its ground-truth distribution.
- Designed and implemented a Bayesian Trie-based algorithm that automatically adjusts token probabilities during decoding according to derived closed-form solutions.

Text2LaTeX: Potential of Language Models in LaTeX Synthesis [Paper] **Sept 2023 – Dec 2023**

- Designed a novel tree-based LaTeX expression generation algorithm for diverse and scalable dataset construction.
- Conducted extensive finetuning on 350M and 2B CodeGen and LLaVA models to better understand the impact of modality and the efficacy of finetuning pre-trained models on LaTeX synthesis based on multi-modal inputs.
- Performed a series of ablation studies and provided analysis to better understand why visual input may not necessarily enhance code generation compared to text-only inputs.

Stochastic Algorithm for Group Distributionally Robust Optimization [Paper] **Sept 2023 – Dec 2023**

- Derived a new formulation for solving GDRO with prior shifts via Benders Decomposition under convex conditions.
- Validated the algorithm's effectiveness through extensive testing, demonstrating superior performance over competitive baselines such as ERM and GDRO with Online Optimization.

INDUSTRY EXPERIENCE

Salesforce **Jun 2025 – present**

Research Intern, AI Research *Palo Alto, CA, USA*

- Developed a multi-agent system to perform complex deep research tasks and designed corresponding evaluation methods and benchmarks.

Genesis MedTech Group **Apr 2022 – Aug 2022**

Mergers and acquisitions (M&A) Intern, Business Development *Shanghai, China*

- M&A Strategy: Assisted in 7 M&A initiatives in the medical devices sector by performing comprehensive desk research, conducting expert interviews, and due diligence while aiding negotiation including Term Sheet review and risk & opportunities assessment.
- Financial Benchmarking: Developed financial analysis templates for 100+ comparable listed companies, facilitating automatic performance tracking against industry benchmarks.
- Streamlined financial valuation processes for the Group's B+ round financing, accelerating valuations by 2 weeks through the implementation of WACC and LoMD methodologies.

Alpha Startup Fund **Jun 2021 – Sept 2021**

Intern, Post-investment Management *Beijing, China*

- Supported fundraising of $50M for Phase II fund and the launch of USD and RMB private equity funds.
- Negotiated terms and conditions of Limited Partnership Agreement & Side Letter with Limited Partners, finalizing LPA & saving time by 50%.
- Risk Management: Engaged with 15 portfolio companies across AI, FinTech, SaaS, and IoT sectors to evaluate and advise on risk management and strategic opportunities.

INVITED TALKS

Salesforce AI Research Aug 2025
Multi-agent Systems for Complex Enterprise Research Tasks

MadPL Seminar, University of Wisconsin–Madison Apr 2025
Automated Post-training Development of Large Language Models

Microsoft Research Sep 2024
Spatial Reasoning in Vision–Language Models

AWARDS & HONORS

NeurIPS 2024 Travel Award Oct 2024

National Scholarship (Top 1%) Dec 2020

China "Internet+" Innovation Competition, Regional Prizewinner Sep 2020

SKILLS

Programming & Frameworks: Python (PyTorch, NumPy, Pandas, TensorFlow), UNIX shell, Docker, Kubernetes
Languages: English (Fluent), Laotian (Fluent), Thai (Basic), Mandarin (Native)
Data Visualization & Database: Tableau, Power BI, MySQL, MongoDB
Statistics & Optimization: Gurobi, Stata, R, SPSS
Finance: ACCA (passed 11/13), SAC (Securities Qualification of China), Bloomberg, Wind, Pitchbook, Capital IQ
Interests: Tennis (National Second Level Athlete), Pipa, Chinese Dance, Classical Guitar