Jiaming Shan

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RESEARCH INTERESTS

Primary Focus: Reliable and Capable AI Agents, Large Language Models, Reinforcement Learning
Foundations Methods: Program Synthesis, Formal Methods, Trustworthy AI

EDUCATION

Shanghai Jiao Tong University 2020/9 – 2024.6
Bachelor of Computer Science

- Member of ACM Honors Class, an elite CS program for top 5% talented students
- GPA (All Core Courses): 3.98/4.3, Ranking: 3/36

University of California, Santa Barbara 2024/9 – Now
PhD candidate of Computer Science

PUBLICATIONS

Peer-Reviewed Conference Publications

[1] Building Constrained Human-AI Cooperation: An Inclusive Embodied Social Intelligence Challenge
Weihua Du, Qiushi Lyu, **Jiaming Shan**, Zhenting Qi, Hongxin Zhang, Sunli Chen, Andi Peng, Tianmin Shu, Kwonjoon Lee, Behzad Dariush, Chuang Gan
Conference on Neural Information Processing Systems (NeurIPS), Datasets and Benchmarks Track, 2024. **(Poster)**

[2] Building Cooperative Embodied Agents Modularly with Language Models
Hongxin Zhang*, Weihua Du*, **Jiaming Shan**, Qinhong Zhou, Yilun Du, Joshua B. Tenenbaum, Tianmin Shu, Chuang Gan
International Conference on Learning Representations (ICLR), 2024. **(Poster)**
(* Equal Contribution)

Manuscripts Under Submission

[1] Sentinel: Adaptive Counter-Attack Synthesis for Mitigating Onchain Exploits
Yanju Chen, **Jiaming Shan**, Hanzhi Liu, Jiaxin Song, Hongbo Wen, Yu Feng
Submitted to *International Conference on Software Engineering (ICSE)*, 2026.
Contribution: *Designed a novel real-time defense system that automatically synthesizes and deploys counter-attack smart contracts to mitigate in-flight DeFi exploits.*

[2] MathEye: Scaling Auto-Formalization of Complex Theorems via Angelic Proving
Yanju Chen, Ruizhe Qian, **Jiaming Shan**, Xu Yang, Yufei Ding, Osbert Bastani, Yu Feng
Contribution: *Developed a framework to scale the auto-formalization of complex mathematical theorems by combining LLM-guided decomposition with optimistic proof checking.*

RESEARCH EXPERIENCE

University of California, Santa Barbara Sep 2024 – Present
PhD Student *Advisor: Prof. Yu Feng*

- Engineered **'Sentinel'**, a real-time defense system that mitigates DeFi exploits by automatically synthesizing and deploying counter-attack smart contracts.
- Developed **'MathEye'**, a system that scales the auto-formalization of mathematical theorems by integrating LLM-guided decomposition with optimistic proof-checking.

Massachusetts Institute of Technology (MIT) Aug 2023 – Jun 2024
Research Intern, CSAIL *Advisor: Prof. Chuang Gan*

- Conceptualized and implemented novel physically-constrained agents and helper bots within the ThreeDWorld (TDW) simulation environment.

- Leveraged in-context learning of LLMs to deploy language-based agents for human assistance tasks, generating a new benchmark dataset.
- Co-authored a NeurIPS 2024 publication based on this work, contributing significantly to manuscript writing and data visualization.

MIT / Shanghai Jiao Tong University Feb 2023 – May 2023
Remote Research Inter *Advisor: Prof. Chuang Gan*

- Co-developed a novel framework using LLMs for multi-agent cooperation by translating environmental states into textual prompts.
- Designed and conducted user studies demonstrating that LLM agents collaborate more effectively with humans than heuristic planning baselines.
- Led the implementation of the VirtualHome environment, developed heuristic baselines, and created key result visualizations for the ICLR 2024 paper.

Shanghai Jiao Tong University Jul 2022 – Feb 2023
Undergraduate Researcher *Advisor: Prof. Quanshi Zhang*

- Developed a non-learning generative model by inverting the ReduNet, a network derived from the Maximal Coding Rate Reduction (MCR2) principle.
- Implemented the reverse-process algorithms, incorporating K-means and least squares fitting to ensure reconstruction quality.
- Validated the generative model on the MNIST dataset, fine-tuning components for optimal performance.

Honors & Awards

- 2023 National Scholarship Award
- 2020, 2021, 2022, 2023 Zhiyuan Honorary Scholarship (Top 2% in Shanghai Jiao Tong University)
- 2021 Interdisciplinary Contest In Modeling Honorable Mention
- 2021 Third Prize, National Undergraduate Mathematical Contest in Modeling, Provincial Level
- 2021 Silver Medal, International Physics Competition for University Students

Technical Skills

Programming Languages: Python, C++, Lisp, Java
AI / ML Frameworks: PyTorch, Hugging Face, Scikit-learn, OpenAI API
Formal Methods Synthesis: Lean, Rosette, SAT/SMT Solvers, EVM Bytecode
Developer Tools & MLOps: Git, Docker, LaTeX, Weights & Biases