

# Jiaming Shan

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## RESEARCH INTERESTS

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**Core Interests:** Large Language Models, Autonomous Agents, Reasoning, Long-Context Algorithms

**Research Approach:** Unifying high-level agentic capabilities with low-level algorithmic innovations to realize scalable and capable AI.

## EDUCATION

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### Shanghai Jiao Tong University

*Bachelor of Computer Science*

Sep 2020 – Jun 2024

- 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

*PhD student in Computer Science*

Sep 2024 – Present

## PUBLICATIONS

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### 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] Adaptive Counter-Attack Synthesis for Mitigation of Onchain Exploits  
Hanzhi Liu, Yanju Chen, **Jiaming Shan**, Jiaxin Song, Chaofan Shou, Hongbo Wen, Yu Feng  
Submitted to *International Symposium on Software Testing and Analysis (ISSTA)*, 2026.
- [2] Mid-Segment Editing: Teaching Language Models to Maintain Precise State Through Efficient In-Context Editing  
**Jiaming Shan**, Yuzhou Nie, Eric Xin Wang  
Targeting *Conference on Language Modeling (COLM)*, 2026.
- [3] Proactive Agent Research Environment: Simulating Active Users to Evaluate Proactive Assistants  
Deepak Nathani, Cheng Zhang, Chang Huan, **Jiaming Shan**, Yinfei Yang, Alkesh Patel, Zhe Gan, William Yang Wang, Michael Saxon, Xin Eric Wang  
Submitted to *International Conference on Machine Learning (ICML)*, 2026.

## RESEARCH EXPERIENCE

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### University of California, Santa Barbara

*PhD Student / Research Assistant*

Sep 2024 – Present

- **Mid-Segment Editing (Targeting COLM 2026):** Proposed a novel framework enabling LLMs to perform in-place context editing via unified rewrite operations. Developed GroupedRoPEAttention, a Triton kernel enabling efficient multi-edit training with 2-78× speedup. Validated on state tracking and competitive programming, proving  $O(n)$  efficiency gains in “large state, small edits” tasks.
- **PARE (Submitted to ICML 2026):** Developed the Proactive Agent Research Environment, a framework modeling mobile apps as Finite State Machines (FSMs) for evaluating proactive agents. Contributed to ProactiveMobileBench, a benchmark of 150+ tasks for testing goal inference and multi-app orchestration.

- **MathEye (Auto-formalization):** Developed a system scaling the auto-formalization of mathematical theorems by integrating LLM-guided decomposition with optimistic proof-checking. Demonstrates strong capability in Neuro-Symbolic AI and Mathematical Reasoning.

### Nubit

*Research Intern*

Jun 2025 – Aug 2025

*Advisor: Prof. Yu Feng*

- Developed **Sentinel**, a fully automated run-time defense system that neutralizes pending key on-chain exploits. Designed a conflict-driven optimization loop to synthesize counter-attack smart contracts under strict gas and safety constraints.
- Evaluated on 33 real-world DeFi exploits, preserving an estimated \$167M. The work resulted in the paper “Adaptive Counter-Attack Synthesis for Mitigation of Onchain Exploits” (Submitted to ISSTA 2026).

### Massachusetts Institute of Technology (MIT)

*Research Intern, CSAIL*

Aug 2023 – Jun 2024

*Advisor: Prof. Chuang Gan*

- **Constrained Human-AI Cooperation (NeurIPS 2024):** 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.

### MIT / Shanghai Jiao Tong University

*Remote Research Intern*

Feb 2023 – May 2023

*Advisor: Prof. Chuang Gan*

- **Modular Embodied Agents (ICLR 2024):** 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 and heuristic baselines.

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## 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

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## TECHNICAL SKILLS

**Programming Languages:** Python, C++, Lisp, Java, Triton

**AI / ML Frameworks:** PyTorch, Hugging Face, Scikit-learn, OpenAI API

**Formal Methods & Synthesis:** Lean, Rosette, SAT/SMT Solvers, EVM Bytecode

**AI-Native Workflow:** Cursor, Claude Code, Tmux

**Developer Tools & MLOps:** Git, Docker, LaTeX, Weights & Biases