Buzhao (Tavia) Liu

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EDUCATION

Washington University in St. Louis Aug 2023 – Dec 2026

Bachelor of Science in Computer Science; Second Major in Global Studies *St. Louis, MO*

- GPA: 3.99/4.0
- Research Interests: embodied AI and robot learning, self-evolving LLM agents, AI agent security, multi-agent reinforcement learning, human-AI interaction

PUBLICATIONS & MANUSCRIPTS

(* denotes equal contribution)

- **Buzhao Liu***, Jianing Ye*, Xiu Yuan*, Yangtong Feng, Chengsong Huang, Tyler Dinh, Yevgeniy Vorobeychik, Ning Zhang, and Chongjie Zhang. RoboAuto: Autonomous Robot Program Search through Multi-Level Physical Understanding. *Under review*. arXiv:2610.36533
- **Buzhao Liu***, Xinhang Ma*, and Yevgeniy Vorobeychik. Robust Context-Aware Detection of Malicious Instructions in Text. *Under review*. arXiv:2608.05430
- Jianing Ye, Yang Zhang, Xiu Yuan, **Buzhao Liu**, David Park, Qihan Liu, and Chongjie Zhang. MATCHA: Bridging the Gap between Sample and Wall-Clock Efficiency in Model-Based Multi-Agent Reinforcement Learning. *Under review*
- Sunita Parikh, William O'Brochta, and **Buzhao Liu**. Dialects of Dominance: Navigating Hindi Supremacy and Regional Language Dominance in Indian Municipal Politics. *Submitted to MPSA 2027*
- **Buzhao Liu**. Acting Out Who I Am: Will the Ethnic Identity of Minorities Die Out in Modernization? *Young Scholars Academic Journal*, vol. 3, 2022

RESEARCH EXPERIENCE

Machine Intelligence Group Jan 2026 – Present

Research Assistant (advised by Chongjie Zhang) *St. Louis, MO*

- Developed RoboAuto, a framework for LLM agents to autonomously generate and refine robot policies as executable code using a growing repository of physical knowledge and verified skills
- Outperformed state-of-the-art baselines on LIBERO-PRO, LIBERO-Plus, robosuite, and real-robot tasks; showed that learned physical knowledge transfers to a new simulator and bimanual embodiment in RoboTwin 2.0
- Contributed to MATCHA, a GPU-centric framework for model-based multi-agent RL that uses vectorized frontier search to match or exceed baseline sample efficiency with up to a 16.3× wall-clock speedup
- Extended MATCHA's GPU-centric design to single-agent RL and analyzed how data collection, reanalysis, and model optimization limit training speed across single-agent and multi-agent settings

Vorobeychik Lab Jan 2026 – Oct 2026

Research Assistant (advised by Yevgeniy Vorobeychik) *St. Louis, MO*

- Designed CAD (Context-Aware Detection), a lightweight indirect prompt injection defense for LLM agents that uses the user's query and context to detect and remove malicious instructions from tool outputs
- Hardened CAD against adaptive paraphrasing attacks using adversarial training with embedding perturbations and LLM-generated paraphrases, characterizing the tradeoff between task utility and robustness
- Reduced attack success rates from 60% to 0% under static attacks and to below 10% under adaptive attacks, outperforming state-of-the-art prompt-level and system-level defenses while preserving task utility

Parikh Lab Jan 2025 – Present

Research Assistant (advised by Sunita Parikh) *St. Louis, MO*

- Coded and analyzed 412 interviews with Indian municipal politicians on how dialect choice asserts political power

Ho Lab Aug 2025 – Dec 2025

Research Assistant (advised by Chien-Ju Ho) *St. Louis, MO*

- Built a multi-strategy prompting framework that simulates user populations with LLMs to evaluate AI explanations
- Evaluated LLM-simulated users conditioned on personality traits and cultural background, reproducing the direction of personality effects and improving correlation with World Values Survey responses by 37%

Humanities Digital Workshop Aug 2025 – Dec 2025

Research Assistant (advised by Steven B. Miles) *St. Louis, MO*

- Created a 1904–1940 Chinese immigrant passenger database from 900+ pages of National Archives manuscripts

PRESENTATIONS

Undergraduate Research Symposium, Washington University in St. Louis Nov 2026

RoboAuto: Autonomous Robot Program Search through Multi-Level Physical Understanding *St. Louis, MO*

Ho Lab Meeting, Washington University in St. Louis Nov 2025

Scalable XAI Evaluation Using LLM-Simulated User Populations *St. Louis, MO*

OPEN-SOURCE & DATA CONTRIBUTIONS

Oopsie Data Oct 2026

Contributor

- Designed four manipulation tasks and contributed 750 real-robot trajectories to a multi-lab effort to build a large-scale dataset of real-robot manipulation failures

TEACHING EXPERIENCE

Washington University in St. Louis Aug 2024 – May 2026

Teaching Assistant for courses in programming, data structures, and algorithm analysis *St. Louis, MO*

- Led weekly recitations and office hours to help students with problem solving
- Coordinated the teaching assistant team to facilitate weekly studios as lead TA
- Graded and proctored exams and advised students on lab projects during studios

AWARDS

Tau Beta Pi, The Engineering Honor Society Nov 2026

Dean's List Aug 2023 – Present

LEADERSHIP & SERVICE

Residential Life, Washington University in St. Louis Jul 2025 – May 2026

Residential Advisor *St. Louis, MO*

Office of the Vice Chancellor for Student Affairs, Washington University in St. Louis Jun 2024 – Jun 2025

Student Assistant *St. Louis, MO*

Office for International Student Engagement, Washington University in St. Louis Jul 2024 – Aug 2024

International Student Community Leader *St. Louis, MO*