

EMMA SHEDDEN

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My research focuses on providing ML/AI agents with planning and safety guarantees, using tools from formal methods, algorithms, and programming languages. My current work generates Cedar policies to safeguard terminal agents from prompt injections, and builds a neurosymbolic framework for robotic control with VLAs.

EDUCATION

University of Pennsylvania, Computer and Information Science | Philadelphia, PA *Aug 2024 - May 2029 (expected)*
Doctor of Philosophy, *Computer Science* | Advisors: Rajeev Alur, Osbert Bastani

University of Michigan, College of Engineering | Ann Arbor, MI *May 2024, Summa Cum Laude*
Bachelor of Science in Engineering, *Computer Science* | Minor, *Mathematics*

AWARDS

NSF Graduate Research Fellow | \$159K, < 8% accepted *U.S. National Science Foundation, 2025*
Abel Lukens Stout Fellow | \$3K *University of Pennsylvania, 2024-25*

PUBLICATIONS

Shedden, E., Alur, R., Bastani, B. *Leveraging VLMs for Specification-Guided Policy Learning*. Preprint under review.

Santesteban, P., **Shedden, E.**, Endres, M., Weimer, W. *An Empirical Study of Anonymous, Unmoderated, and Online Peer-to-Peer Programming Tutoring Conversations*. ICSE-SEET '26. **Presenting author.** [doi:10.1145/3786580.3786958](https://doi.org/10.1145/3786580.3786958)

Ahmad, H., Endres, M., Newman, K., Santesteban, P., **Shedden, E.**, & Weimer, W. *Causal Relationships and Programming Outcomes: A Transcranial Magnetic Stimulation Experiment*. ICSE '24. **Distinguished Paper Award.** [doi:10.1145/3597503.3639096](https://doi.org/10.1145/3597503.3639096)

Chu, S., **Shedden, E.**, Zhang, C., Meira-Góes, R., Moreno, G. A., Garlan, D., & Kang, E. *Runtime Resolution of Feature Interactions through Adaptive Requirement Weakening*. SEAMS '23. [doi:10.1109/SEAMS59076.2023.00025](https://doi.org/10.1109/SEAMS59076.2023.00025)

RESEARCH EXPERIENCE

Westley Weimer Lab | University of Michigan, Computer Science and Engineering *Sep 2022 - Aug 2024*

- Designed rigorous statistical and qualitative analyses for human cognitive and psychometrics studies

Dr. Hai Le & LoG(M) | University of Michigan, Department of Mathematics *Jan 2023 - Apr 2023*

- Implemented and analyzed 4 competing algorithms for simulating standard and fractional Brownian motions

Eunsuk Kang Lab & REUSE | Carnegie Mellon University, Software and Societal Systems *Jun 2021 - May 2022*

- Designed a MILP-based reconciliation framework to resolve feature conflicts in cyber-physical systems

PROFESSIONAL EXPERIENCE

Software Engineer Intern | **Meta Platforms, Inc. (Facebook)** *May 2022 - Aug 2022*

Designed and implemented a generalized service and library to enforce internal access controls on AI assets, scaled to reliably handle over 200 million queries per second using limited cloud resources

TEACHING EXPERIENCE & SERVICE

CIS 4190/5190: Applied Machine Learning | University of Pennsylvania *Aug - Dec 2025 & 2026 (present)*
2 semesters | 200 enrolled, 10 course staff | Developed and taught the 2-lecture unit on Reinforcement Learning

EECS 203: Discrete Mathematics | University of Michigan *Jan 2022 - Apr 2024*
5 semesters | 900 enrolled, 20 course staff

Student Volunteer | 37th IEEE/ACM International Conference on Automated Software Engineering (ASE) *Oct 2022*