

Molly MacLaren

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EDUCATION

Carnegie Mellon University, School of Computer Science

Ph.D. Software Engineering

Aug 2025 - Present

National Science Foundation Graduate Research Fellow (NSF GRFP)

Apr 2026 - Present

University of California, San Diego

B.S. Computer Engineering

Sept 2021 - Mar 2025

EXPERIENCE

Software and Societal Systems Department, CMU SCS

Aug 2025 - Present

Testing and Program Analysis Research Assistant

Pittsburgh, PA

- Profiling the runtime of *Miri*, an undefined behavior detector in Rust, to identify the overhead costs across codebases.
- Contributing to the development of *Borrow Sanitizer*, a tool for finding memory aliasing violations in unsafe Rust and foreign-function calls, by implementing a debug mode and creating actionable output messages.

Lawrence Livermore National Laboratory

June 2024 - Sept 2024 / May 2025 - Aug 2025

Applied Formal Methods Research Assistant

Livermore, CA

- Formally verified a Rust implementation of the underlying data structure and union-find algorithm for e-graphs with multiple verification tools to analyze usability and applications for software engineering workflows.
- Worked on the design of *Russet*, an FPGA formal verification tool, and verified an implementation of the Serial Peripheral Interface (SPI) protocol.

UCSD Computer Science and Engineering (CSE)

Sept 2024 - Dec 2024

Tutor for CSE 12: Intro to Data Structures

San Diego, CA

- Held weekly tutor hours (1-on-1 sessions with students from a variety of computing backgrounds and majors) to identify and correct misconceptions and provide guidance in implementing data structures in Java.

SALAD Lab, UCSD CSE

June 2023 - Aug 2025

Programming Languages Research Assistant

San Diego, CA

- Analyzed frequency and time spent on compiler debug sessions among programmers in Rust.
- Developed *SALT*, a VSCode extension for hosting studies to analyze compiler errors and paradigm usage in Rust.
- Designed code review snippets and semantically analyzed participant reviews between paradigm and participant exp.

Ujima Lab, UCSD CSE

Sept 2022 - Aug 2023

Privacy and Security Research Assistant

San Diego, CA

- Designed and deployed surveys based on weaknesses discovered in VR and gaming privacy policies.
- Performed NLP analysis on 30k online posts to find the most pressing privacy topics in gaming communities.
- Presented a poster at JSOE's Undergrad Research Symposium and a workshop paper in WIPS, part of SOUPS 2023.

ACM Cyber, UCSD Student Org

Apr 2022 - June 2025

Competitions Committee and Board Member

San Diego, CA

- Hosted informational events for undergrads and high school students on introductions to cybersecurity topics.
- Organized Capture-the-Flag (CTF) teams and meet-ups for club members to practice cybersecurity skills.
- Forensics, Rev, and OSINT challenge writer for *SDCTF* since 2023.

PAPERS, POSTERS, AND PRESENTATIONS

- *WORKING PAPER*: **Molly MacLaren**, Serena Chen, Michael Coblenz, “A Rust-Based Comparison of Functional and Imperative Programming”, 2026, <https://macla.ren/rusty-preprint.pdf>
- *POSTER*: **Molly MacLaren**, Edwin Westbrook, Matthew Sottile, “Introducing Russet: Hardware Formal Verification with Mealy Machines”, LLNL Summer Student Showcase 2025, <http://macla.ren/russet-poster.pdf>
- *WORKING PAPER/ARTIFACT*: **Molly MacLaren**, John Sarracino, Edwin Westbrook, Matthew Sottile, “Usability Lessons Towards Adopting Deductive Verification in Mainstream Rust Development”, 2024, <http://macla.ren/ufcert-preprint.pdf> – <https://zenodo.org/records/14279430>
- *PRESENTATION*: **Molly MacLaren**, John Sarracino, Edwin Westbrook, Matthew Sottile, “Formal Verification for Rust: Where are we now?”, LLNL CSP Summer SLAM 2024, <http://macla.ren/rusty-fm.pdf>
- *PUBLICATION*: Ruochen Wang, **Molly MacLaren**, Michael Coblenz, “REVIS: An Error Visualization Tool for Rust”, HATRA 2023, <https://arxiv.org/abs/2309.06640>
- *PRESENTATION*: **Molly MacLaren**, Ruochen Wang, Michael Coblenz, “What We Can Learn from Your Mistakes: A Study of Rust Errors”, UCSD SRC 2023, <http://macla.ren/rusty-errs.pdf>
- *PUBLICATION*: **Molly MacLaren**, Jared Jose, Runpeng Jian, Zheng Zeng, Jay Jhaveri, Imani N.S. Munyaka, “Work in Progress: Privacy Protection for Children 13+ in Virtual Worlds”, WIPS 2023, <https://macla.ren/vr-privacy-youth.pdf>
- *POSTER*: **Molly MacLaren**, Jared Jose, Runpeng Jian, Zheng Zeng, Jay Jhaveri, Imani N.S. Munyaka, “Interpreting Privacy Expectations in Virtual Environments”, JSOE URS 2023, <http://macla.ren/vr-privacy-poster.pdf>