Raven Rothkopf

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RESEARCH INTERESTS | AI-Assisted Programming, End-user Programming, Neurosymbolic Program Synthesis

EDUCATION

University of California, San Diego | La Jolla, CA | *PhD in Computer Science* | Started Fall 2024 | GPA 3.9
Barnard College, Columbia University | New York, NY | *BA Computer Science* | Graduated Spring 2024 | GPA: 3.8

RESEARCH EXPERIENCE

Programming Systems Group, UC San Diego | La Jolla, CA | *Graduate Student Researcher* | Fall 2024 - Present
- Advised by Nadia Polikarpova and Sorin Lerner
- Designed, developed, and evaluated a tool to help programmers explore variation in AI code completions

CISPA Helmholtz Center for Information Security | Saarbrücken, Germany | *Visiting Researcher* | Summer 2024
- Accompanied Prof. Mark Santolucito as a visiting researcher in the Reactive Systems Group
- Developed a framework for synthesizing neurosymbolic AI agents via temporal logic specifications

Programming Languages Lab, Barnard College |New York, NY| *Research Assistant* | Winter 2022 - Spring 2024
- Conducted novel research at the Barnard PL Lab towards reactive program synthesis as a programming paradigm using Javascript, Typescript, and Haskell
- Investigated ideal testbeds for learning specification engineering with temporal logics by integrating reactive synthesis with musical composition, dynamic animation, and game development domains

Sunshine Lab, REUSE, Carnegie Mellon University | Pittsburgh, PA | *SWE Research Assistant* | Summer 2023
- Contributed to Rose, an eDSL for efficient, extensible, web-based automatic differentiation written in Rust and Typescript to improve the optimization engine of Penrose, an open source, text-to-visual diagramming system
- Learned state-of-the-art autodiff languages like Google's JAX and Dex and corresponded with Google researchers to contextualize Rose's contributions within existing literature; Advised by Sam Estep and Joshua Sunshine

HONORS & AWARDS

Best Paper, IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC) | 2025
Best Short Paper, IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC) | 2025
Graduate Research Fellowship, National Science Foundation (NSF GRFP) | 2024
3rd Place Winner, Student Research Competition at the ACM SIGPLAN International Conference on Systems, Programming, Languages and Applications: Software for Humanity (SPLASH) | 2023
PLMW Scholarship, Symposium on Principles of Programming Languages (POPL) | 2023

PUBLICATIONS & PREPRINTS

- **HiLDe: Intentional Code Generation via Human-in-the-Loop Decoding** | Emmanuel Anaya González*, Raven Rothkopf*, Sorin Lerner, Nadia Polikarpova | VL/HCC 2025, *Best Paper* | arXiv
- **The Command Line GUIde: Graphical Interfaces from Man Pages via AI** | Saketh Ram Kasibatla*, Kiran Medleri Hiremath*, Raven Rothkopf, Sorin Lerner, Haijun Xia, Brian Hempel | VL/HCC 2025, *Best Short Paper* | arXiv
- **Connecting the dots: Evaluating abstract reasoning capabilities of LLMs using the New York Times Connections word game**| Prisha Samdarshi, Mariam Mustafa, Anushka Kulkarni, Raven Rothkopf, Tuhin Chakrabarty, Smuranda Muresan | EMNLP 2024 | DOI
- **Rose: Composable autodiff for the interactive web**| Sam Estep, Wode Ni, Raven Rothkopf, Josh Sunshine| ECOOP 2024 | DOI
- **Towards the Usability of Reactive Synthesis: Mapping TSL Misconceptions to Mitigations** | Leyi Cui*, Raven Rothkopf*, Mark Santolucito | PLATEAU 2024 | DOI
- **Enforcing Temporal Constraints on Generative Agents with Reactive Synthesis** | Raven Rothkopf,

Hannah Tongxin Zeng, Mark Santolucito | presented at PLATEAU 2024, arXiv

▪ **Rose: Extensible autodiff on the web** | Raven Rothkopf | SPLASH SRC 2023, *3rd Place Award* | DOI

▪ **Towards the Usability of Reactive Synthesis: Building blocks of temporal logic** | Raven Rothkopf, Leyi Cui, Arya Sinha, Mark Santolucito | PLATEAU 2023 | DOI

LEADERSHIP & SERVICE

Artifact Evaluation Committee | TACAS 2025

Student Volunteer | PLDI 2024, OOPSLA 2024, PLATEAU 2025

Student Liaison, Computer Science Department, Barnard College | Fall 2022 – Spring 2024

▪ Led weekly CS Social Hour for students interested in CS to uplift women and gender minorities, engaging 50+ attendees; Collaborated with department head to organize program planning meetings for a record 30+ attendees

▪ Deployed and managed mentorship program to demystify challenges in CS such as getting into research, exploring fields in CS through introductory workshops, and applying to internships

SKILLS

Programming ▪ TypeScript ▪ JavaScript ▪ Python ▪ React ▪ Lean ▪ Haskell ▪ LaTeX ▪ Accessible Web Development (HTML, CSS) ▪ Agentic Programming Workflows

Tools/Frameworks ▪ Github & Git ▪ Figma ▪ vLLM ▪ Z3 ▪ Unity ▪ Docker ▪ JAX ▪ Microsoft Suite

Research ▪ Contextual Inquiry ▪ Grounded Theory ▪ Interview ▪ Survey ▪ Software usability testing ▪ Thematic Analysis ▪ Statistical Analysis