AARON ELINE

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ABOUT ME

Computer Science researcher focused on the areas of programming languages, fuzzing, automated reasoning, and security. Interested in making computer systems orders of magnitude more trustworthy.

EDUCATION

University of Maryland, College Park *2021 - 2022*
MS Computer Science.

University of Maryland, College Park *2017 - 2021*
BS Computer Science, concentration in Cyber Security.

WORK EXPERIENCE

Amazon Web Services - Automated Reasoning Group 2024-Present
Applied Scientist

- Lead the design and implementation of a random property testing workflow into the Kiro IDE for specification based development (Launched November 2025).
  - Provides evidence for customers that LLM-synthesized programs conform to specifications.
  - Designed an interactive user interface for refining specifications given counterexamples.
- Designed and implemented a novel JVM code reasoning platform.
  - Responsible for implementation of random testing component for effective disproof of program properties.
  - Built automated fuzz harness infrastructure
- Managed intern research projects:
  - Automated synthesis of constrained random generators in the Lean theorem prover
  - Utilizing language models to drive test case generation for testing program properties

Amazon Web Services - Automated Reasoning In Identity 2022 - 2024
Applied Scientist

- Designed and implemented the Cedar Policy Language, an open source authorization policy language.
  - Language supports a sound and complete analysis via compilation to SMT, and a sound type system.
  - Performed a formal verification of Cedar in the Lean theorem prover.
  - Built an automated random differential testing setup and ran experiments on effectiveness.
  - Resulted in two research papers appearing at major PL/SE venues.
- Managed an intern research project investigating the effectiveness of various random testing strategies.

Correct Computation 2019 - 2022
Software Engineer / Researcher

- Created *Checked C* language tooling, an extension to the C language that adds spatial memory safety.
  - Developed 3C, a tool for automated best-effort conversion of legacy C code into Checked C, built on top of the Clang compiler infrastructure.
  - Developed 5C, a tool that integrates 3C into a develop-in-the-loop workflow for iteratively converting C into Checked C

- Published a research paper at a top PL venue, awarded Distinguished Paper.

PUBLICATIONS

Eline, Aaron. "Does your code match your spec?". Blog post for the Kiro IDE available at kiro.dev/blog/property-based-testing

Disselkoen, Craig, et al. "How we built Cedar: A verification-guided approach." Companion Proceedings of the 32nd ACM International Conference on the Foundations of Software Engineering. 2024.

Cutler, Joseph W., et al. "Cedar: A New Language for Expressive, Fast, Safe, and Analyzable Authorization." Proceedings of the ACM on Programming Languages 8.OOPSLA1 (2024): 670-697.

Paraskevopoulou, Z., Eline, A., & Lampropoulos, L. (2022, June). Computing correctly with inductive relations. In Proceedings of the 43rd ACM SIGPLAN International Conference on Programming Language Design and Implementation (pp. 966-980).

Machiry, A., Kastner, J., McCutchen, M., Eline, A., Headley, K., & Hicks, M. (2022). C to Checked C by 3C. Proceedings of the ACM on Programming Languages, 6(OOPSLA1), 1-29. (Distinguished Paper)

TALKS

DC Systems - Testing and Verification : Scalable High Assurance - 2024, watch here

JHU Undergraduate Security and Privacy - Guest Lecturer : Intro to High Assurance Programming - 2024

UPenn Distributed Systems Group - Testing and Verification : Scalable High Assurance - 2024

FSE 2024 - How We Built Cedar: A Verification Guided Approach - 2024

NJPLSS - Cedar: A language for expressing fast, safe, and fine-grained authorization policies - 2024

JHU Undergraduate Security and Privacy - Guest Lecturer - The Cedar Authorization Language - 2023

JHU Graduate Security Group - Gradually Achieving Memory Safety - 2022

PROGRAM COMMITTEES

PC Member, RECODE Workshop 2026

PATENTS

Authorization policy validation, US20240179182A1

Authorization policy evaluation, US20240179181A1

VOLUNTEER EXPERIENCE

DC Systems
- Manage and recruit speakers for a local series of tech talks
- Online at dcsystems.xyz

Bridge to Academic Excellence
- Tutoring of grade school students in Baltimore, MD.