Jamie Fulford

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Education

University of Virginia **June 2022 – May 2025**

B.S. Computer Science and Mathematics *Charlottesville, Virginia, United States*

- **GPA:** 3.9, **Major GPA:** 3.94
- **Activities and Societies:** Putnam Problem Solving Group, International Collegiate Programming Contest, Math Club

Relevant Coursework

- Computer Sys. & Org.
- Data Structures & Alg.
- Artificial Intelligence
- Discrete Math
- Probability
- Linear Algebra
- (Grad) Number Theory
- Abstract Algebra

Research Experience

Virginia Tech Systems Software Research Group **January 2025 – Present**

Research Assistant *Remote*

- Proof engineer for verification project developing type systems and compiler verification for Linux eBPF using Coq
- Contributing to verified compiler framework ensuring safety properties of kernel-level programs
- Manuscript in preparation

University of Pennsylvania **May 2024 – August 2024**

Research Fellow *Philadelphia, Pennsylvania*

- Participated in an NSF-funded Research Experience for Undergraduates (REU) program under Steve Zdancewic, focusing on programming language theory and verification.
- Developed and formalized a novel lambda calculus for parallel computation in Coq, constructing machine-checked proofs of type safety and confluence properties.
- Applied advanced Coq tactics and dependent type theory to verify the correctness of the language's operational semantics and type system.

University of Virginia **May 2023 – Aug 2023**

Research Assistant *Charlottesville, Virginia*

- Designed and integrated real-world hacking scenarios and labs, providing students with practical cybersecurity experience.
- Utilized Terraform for Infrastructure-as-Code to streamline the setup and modification of cloud infrastructure.
- Deployed labs on Azure cloud, ensuring scalability, high availability, and an optimal user experience for students.

University of Virginia **Sep 2022 – Dec 2022**

Research Assistant *Charlottesville, Virginia*

- Conducted design, modeling, and atomistic simulation of materials for energy conversion and storage applications.
- Developed advanced computational tools to perform and analyze simulation results, contributing to cutting-edge research in material science.

Teaching Experience

University of Virginia **Fall 2023, Fall 2024**

Head Teaching Assistant *Charlottesville, Virginia*

- Led a team of TAs for Computer Systems and Organization, managing over 500 students.
- Developed and optimized autograding tools in Python for lab assignments.

Academic Service

Programming Languages Mentoring Workshop (PLMW) Scholarship - POPL 2025 **January 2025**

Talks

REU In Programming Languages - The Effectiveness of Formalization **Summer 2024**

- Discussed the role of formal methods in programming language design, focusing on the practical benefits of formalization in the development of a new lambda calculus variant.

Directed Reading Program – On Primes and Irreducibles: Aren't they the same? **Spring 2023**

- Examined the subtle distinctions in algebraic number theory between primes and irreducibles in general rings, culminating in a classic result related to the Riemann Zeta Function.

Projects

Multi-layer Perceptron From Scratch **May 2024**

- Created perceptron libraries for C, Python, and Rust with minimal dependencies.
- **Skills:** Python, C, Rust, Machine Learning, Library Development

Real-time Edge Detection **April 2024**

- Implemented a real-time edge detection algorithm using the Canny method in Rust.
- **Skills:** Rust, Computer Vision, Parellel Computing, Image Processing

Ethical Hacking Lab **Summer 2023**

- Built a comprehensive lab environment to learn and practice ethical hacking techniques
- **Skills:** Cybersecurity, Infrastructure as Code (Terraform), Scripting, Cloud Security

Technical Skills

Languages: Python, Java, C++, C, Rust, Haskell, OCaml, SQL, Bash
Technologies/Frameworks: Linux, PyTorch, TensorFlow, LaTeX, Git, MySQL, NixOS

Diversity, Equity, and Inclusion

A. James Clark Scholar **July 2022**

University of Virginia *Charlottesville, Virginia*

- The Clark Scholars Program is built on a cohort model that emphasizes the integration of four program pillars: Global Engagement, Business Acumen, Leadership Development, and Service Collaboration.