# Samuel Mucyo

sammucyo@college.harvard.edu; **web:** sam-mucyo.github.io

## EDUCATION

**Harvard University**, Cambridge, MA Graduation Date: May 2025

Bachelor of Arts in Computer Science

*Relevant Coursework:* Data Structures & Algorithms, Machine Learning, High-Performance Computing, Database Systems, Systems Programming & Machine Organization, Systems Development, Data Science

## SKILLS

- **Backend Development:** Python, Java, SQL, AWS, CI/CD (GitHub Actions), Docker, Bash
- **Web Development:** Flask, React, JavaScript, HTML, CSS
- **Development Tools:** Git, Linux/Unix environments, CI/CD (GitHub Actions), Bash
- **Data Science & ML:** R, TensorFlow, Pandas, statistical analysis
- **HPC & Systems Programming:** C, C++, POSIX threads, OpenMP, MPI, GDB, Valgrind

## EXPERIENCE

**Amazon** *Seattle, WA*

*Software Development Engineer Intern* May 2024 - August 2024

- Created a reusable A/B testing framework for dynamic profile badges using Java/Spring MVC, reducing similar A/B experiment deployment time from weeks to days
- Improved API usage and accuracy by identifying and resolving misuse of the internal A/B API, which caused excessive triggers and signal noise

*Software Development Engineer Intern* May 2023 - August 2023

- Architected APIs for a rule-based risk monitoring and alarming system to reduce fraudulent activity detection time by working collaboratively with software engineers, data engineers, and investigators
- Developed a new Python-based backend with AWS CDK, enabling rapid and consistent deployments
- Leveraged AWS Lambda and DynamoDB for scalability and resource utilization

**Harvard University**

*Teaching Fellow, Introduction to Computer Science (CS50)* Fall 2022 and Fall 2023

- Conducted code reviews for over 40 student projects and weekly problem sets through grading, providing feedback on code quality, memory management, and algorithm efficiency
- Mentored students 6 hours/week, focusing on debugging issues in C, Python, and JavaScript
- Led weekly 2-hour hands-on lab sessions, covering topics such as introduction to data structures & algorithms in C, and web development with Flask, HTML, CSS, and JavaScript

## PROJECTS

**Optimized Column-Store Database System**

*Individual Project: Data Systems* Fall 2024

- Designed and developed a high-performance columnar database engine supporting select-project-join queries storage optimizations, including B-trees for indexing and memory-mapped files for persistence
- Enhanced query execution and concurrency by implementing multi-threaded scan operators, resulting in a top 3 placement in class benchmarks for index operations and skewed data performance
- Containerized the codebase with Docker to simplify development, testing, and deployment workflows, improving maintainability and reproducibility

**Astrolibrary**

*Group Project: Systems Development for Computational Science* Fall 2023

- Delivered a Python library for astronomical spectral analysis by collaboratively designing API contracts, ensuring alignment with project requirements
- Developed and tested core functionality, supplemented with a comprehensive test suite using *pytest* for unit and integration tests and documentation using *Sphinx*, for maintainability and ease of use
- Automated CI/CD pipeline for seamless builds, testing, and deployment with GitHub Actions