

# Samuel Mucyo

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

## EDUCATION

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**Harvard University**, Cambridge, MA

Graduation Date: May 2025

Bachelor of Arts in Computer Science

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

**Teaching Fellow, Introduction to Computer Science (CS50)**

*Harvard University*

Fall 2022 and Fall 2023

- Conducted detailed 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

## EXPERIENCE

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**Amazon**

*Seattle, WA*

*Software Development Engineer Intern at Amazon.com*

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; Conducted a statistical analysis to support the redesign

*Software Development Engineer Intern at Amazon.com*

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

*Software Development Engineer Intern at AWS - Redshift*

June 2022 - August 2022

- Designed a serverless data lake using Python, AWS S3, and Glue to enhance bottleneck detection in Redshift infrastructure testing
- Automated data pipeline integration with internal visualization tool to provide detailed insights, enabling fast, data-driven decisions

## PROJECTS

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**Optimized Column-Store Database System**

*Individual Project: Data Systems*

Fall 2024

- Developed a high-performance columnar database engine supporting select-project-join queries with optimized storage techniques, including B-trees for indexing and memory-mapped files for persistence
- Optimized query execution and concurrency by implementing multi-threaded scan operators, achieving a top 3 placement in class benchmarks for index operation and skewed data handling

**Astrolibrary**

*Group Project: Systems Development for Computational Science*

Fall 2023

- Delivered a Python library for astronomical spectral analysis. Collaboratively designed 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.

## SKILLS

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- **Cloud & Backend Development:** Python, Java, Spring MVC, AWS, CI/CD (GitHub Actions)
- **Data Engineering:** SQL, database design, data pipelines, ETL, AWS Glue