Lucas Sta Maria

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EDUCATION

Northeastern University *Boston, MA*
Bachelor of Science in Computer Science and Mathematics *Expected May 2025*
Teaching Assistant:

- Programming Languages (Spring 2023, Fall 2023, Spring 2024 – Head TA)
- CS I (Fall 2024 – Autograding Infrastructure Lead)
- Logic & Computation (Spring 2025)

Computer Science Courses: Programming Languages, Compilers, Concurrent Programming, Algorithms, Graphics
Mathematics Courses: Advanced Linear Algebra, Advanced Probability & Statistics, Group Theory, Graph Theory

EXPERIENCE

Amazon May 2024 – August 2024
Software Development Engineer Intern *Seattle, WA*

- Identified and resolved specification misalignment of **Swift** runtime of **Amazon States Language** (ASL), adding comparison operators for payload states data, reducing nondeterministic state failures, and improving developer-facing errors.
- Created a base widget skeleton component for the homescreen of the reworked **Amazon Flex** delivery app with **SwiftUI**.
- Implemented a dynamic newsfeed widget on the homescreen for drivers, creating a expandable stack with user interactions.
- Introduced a manager for newsfeed updates integrating with persistent app state, reducing load burden on the backend.

Amazon May 2023 – August 2023
Software Development Engineer Intern *Seattle, WA*

- Architected and introduced five new passes to an internal compiler in **Java** to transform between two critical Alexa developer configuration languages, helping backfill **500+** Alexa service configurations and improving Alexa developer velocity.
- Designed a new intermediate representation (IR) to support metadata labels, external schema files, and composed attributes.
- Refactored existing architecture of the compiler to support multiple stages of different IRs by using the visitor pattern.
- Wrote a code generation pass for the compiler that recursively traversed the IR to generate its corresponding configuration.
- Developed a comprehensive suite of compiler-oriented unit and end-to-end tests with **JUnit**, maintaining **95+%** test coverage.

Cigna May 2022 – August 2022
Software Engineer Intern *Boston, MA*

- Optimized performance throughput by **40%** for an existing insurance claim eligibility microservice receiving **100,000+** daily requests by improving the efficiency of **SQL** database queries.
- Increased responsibility of the microservice in **C#** and **.NET** by adding functionality for analyzing, organizing, and redirecting insurance claims, along with facilitating the transition to an organization-wide version 2 API.

PROJECTS

HTDP Autograder August 2024 – Present
Autograder for Racket Student Languages

- Led the design and development of a declarative domain-specific language in **Racket** for homework autograder specifications.
- Sandboxed submissions in **Docker** and added functionality for evaluating the robustness of student functions and tests.
- Improved manual grading velocity for images produced by code through rendering and uploading images to an **S3** bucket.

x64 Compiler January 2023 – April 2023
Functional Programming Language

- Implemented a functional programming language compiler in **OCaml** targeting **x64 assembly** with a **C runtime**.
- Added bidirectional type-checking with **Racket** and **miniKanren**, along with garbage collection and various optimizations.

UFDS Training June 2021 – June 2024
Competitive Programming Training Platform

- Scaled the platform with **Firebase** to help **1000+ active users** achieve top placements in competitions (**IOI**, **APIO**, **INOI**).
- Developed platform with **React.js** and **Rust**, containerizing jobs with IOI Isolate for user-submitted code evaluation.

SKILLS

Programming Languages: Java, Racket, Python, Rust, JavaScript, OCaml, C++, SQL
Tools & Technologies: Linux (NixOS, Arch), Git, Bash, AWS (Lambda, S3), PostgreSQL, Redis, SQLite, Docker, GitHub Actions