Sami **Timsina**

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Projects

Capri
Haskell

PROGRAMMING LANGUAGE / COMPILER

- A statically typed, general purpose programming language with an emphasis on functional programming and overall simplicity.
- Implemented and extended a Hindley-Milner polymorphic type system, using research papers and other online resources as reference.
    - Extensions include: extensible and anonymous records, isorecursive types, and typeclasses (currently being implemented).
- Wrote a handmade pretty-printer for code generation for the original C target.
- Currently targets LLVM by interacting with the LLVM FFI provided by another Haskell library.

Artemis
Haskell

PROGRAMMING LANGUAGE / INTERPRETER

- A statically typed, high level, interpreted functional programming language.
- Implemented a Hindley-Milner polymorphic type system and extended it with isorecursive types.
- Wrote and optimized a tree-walking interpreter to squeeze out maximum performance.
    - Out-performs a previous tree-walking interpreter written in Rust with 2x code execution speed consistently.

Personal Blog
TypeScript, JavaScript, HTML/CSS

WEBSITE   *https://blog.stimsina.com*

- Implemented with a headless CMS (Sanity.io). Worked with GROQ and the Sanity API.
- Used various web frameworks such as Next.js, Tailwind CSS, and more.
- Hosted both blog and personal studio site (to write blog posts) on Vercel.
- Performed some SEO optimizations (dynamically generating good sitemaps, using proper meta tags, etc).

Physics Engine
C, C++, GLSL

3D GRAPHICS AND PHYSICS ENGINE

- Worked with graphics APIs such as OpenGL.
- Wrote low-level, performance critical C++ code.
- Implemented a Verlet integration solver for the physics simulation.
- Wrote GLSL shaders.
- Implemented a graphical user interface with Dear ImGui.

More projects on my **GitHub profile** (github.com/05st)

Experience

V Programming Language

TEAM MEMBER   *Sep. 2021 - Oct. 2021 (2 months)*

- Worked on all aspects of the compiler pipeline (parsing, semantic analysis, code generation, etc).
- Submitted dozens of detailed pull requests and opened issues. At times, also reviewed other contributors' code.

RootKit Inc.

CTF ORGANIZER   *Jul. 2021 - Oct. 2022*

- On and off volunteer position responsible for organizing multiple online capture-the-flag (CTF) events.
- Researched topics in cybersecurity, cryptography, and forensics, to set up unique challenges.
- Created websites for the events from scratch, purposely leaving in security vulnerabilities.
    - Implemented a system to track real-time participant progress.
- Frequently communicated with other RootKit staff to discuss ideas, provide updates on my progress and future plans, etc.

Education

University of Waterloo
Waterloo, Ontario, Canada

BACHELOR OF COMPUTER SCIENCE, HONOURS   *2023 - 2028 (expected)*

- President's Scholarship of Distinction for an admission average of 95% or greater.

Fort Richmond Collegiate
Winnipeg, Manitoba, Canada

HIGH SCHOOL DIPLOMA   *2020 - 2023*

- Subject award for CS42S (AP Computer Science) for the highest mark in the course (100%).
- Created and hosted the school's first computer science contests to raise interest in the national Canadian Computing Competition.
- Graduated with 42 credits (30 are required), including several AP courses for which I received a 5/5 on all of their respective exams.