Zacharie Tevaearai

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Computer Science graduate with research interests in compiler engineering, programming language theory, and formal methods. Currently seeking a PhD position in these areas.

Education

Master in Computer Science 2022 - 2025

EPFL (École Polytechnique Fédérale de Lausanne)
- Grade 5.63/6
- Relevant courses
  - Advanced compiler construction 5.5/6
  - Formal verification 5.5/6
  - Computational complexity 6/6
  - Foundations of software 5/6

BSc in Computer Science 2019 - 2022

EPFL (École Polytechnique Fédérale de Lausanne)
- Grade 5.57/6
- Relevant courses
  - Computer language processing 5.5/6
  - Functional programming 6/6
  - Software development project 6/6
  - Software engineering 5.75/6

Research Experience

Optimizing regex compilers **SYSTEM F**
C++ / Rust / x86 Clément Pit-Claudel

Two compilers from modern regular expressions to native code (x86). One built within V8 and one as a standalone Rust library. The resulting code is ReDoS resilient, and matches the performance of state-of-the-art backtracking engines in some cases. Master thesis, 30 credits during 17 weeks. Grade: 6/6.

Linear Regex **SYSTEM F**
OCaml / Wasm Clément Pit-Claudel

Optimizing compiler from regular expressions to WebAssembly. The resulting Wasm executes in linear time. Usable from JavaScript, runs 4 times faster on average than the linear engine in V8. Master research project, 12 credits during 14 weeks (~312 hours of work). Grade: 6/6.

Flatpak Rebuilder **HexHive**
Python Mathias Payer

CLI tool to verify the integrity of a Flatpak locally using reproducible builds. Bachelor research project, 8 credits during 14 weeks (~228 hours of work). Grade: 5.25/6.

Experience

Research Intern **Oracle Labs**
Aug 2024 - Jan 2025

Worked on the TRegex regex engine, as part of my work on GraalVM and Truffle. This included adding support for bounded quantifiers in DFA mode, which made TRegex the first regex engine to support efficiently this feature.

Student Teaching Assistant **EPFL**
Sep 2022 - Dec 2023

Assistant for Introduction to Multiprocessor Architecture, Stochastic Models in Communication, Software Engineering, Software Construction.

15 hours of work per week. Answered questions during exercise sessions and online, answered half of Sweng's questions on Ed. Created exercises and exams. Graded assignments and exams with more than 700 copies graded in total.

Software Project Coach **EPFL**
Feb - Jun 2023

7 hours of work per week. Coach for 4 groups building an Android app. Helped them use good software engineering practices, to structure their project and to use modern tools. Coached 22 students, reviewed 359 PR. One group scored 3rd out of 22 at the final app competition.

Skills

Programming languages: Proficient in **Rust**, **C**, **Java**, **Kotlin**, **Python**, **Scala**. Comfortable with the **Rocq** prover, **C++**, **OCaml**, **Wasm**, **C#**.

Tooling: Familiar with **Linux**, **Git** and various **CI/CD** pipelines such as **GitHub actions**.

Game Development: Used the Bevy, Godot and Unity game engines for various game jams.

Natural languages:
- English - fluent
- French - mother tongue (Swiss citizen)
- German - basic
- Japanese - basic