

Eric Liu

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TECHNICAL SKILLS

Languages: Python, C, C++, Java, TypeScript, JavaScript, HTML, CSS, Racket

Technologies: Next, React, Express, Flask, SDL2, jQuery, PostgreSQL, AWS S3

EXPERIENCE

Municipal Property Assessment Corporation

May 2024 – August 2024

Software Developer Coop | TypeScript, React, Flowable BPMN, AWS Lambda, S3

Pickering, Ontario

- Built an application for 1,500+ property evaluators, unifying 20+ legacy workflows into a streamlined solution
- Created 10+ forms and process flows in Flowable, with a component to fetch, render, save and complete forms
- Reduced form API calls from 4 to 1, cutting response times and AWS Lambda invocations by 75%

Iroquois Ridge High School

June 2022 – June 2023

Programming Club President and Math Club Co-President

Oakville, Ontario

- Instructed a cohort of 100+ students in competitive programming algorithms and data structures, subsequently introducing them to real-world projects such as making a Discord bot with the discord.py library
- Prepared students for success in prestigious math contests with insightful concepts and tricky theorem applications

PROJECTS

Stirling-PDF Maintainer | *Java, HTML, CSS, JavaScript, TypeScript*

- Maintained a high-impact Spring-stack web application garnering a remarkable 41k+ GitHub stars as a key contributor, incorporating various technologies such as PDFBox, BouncyCastle, and ImageIO
- Identified and implemented a strategic approach to sequentially load individual pages of documents, significantly mitigating server crashes and substantially optimizing memory consumption for PDFs with extensive page counts
- Worked on the ongoing development of version 2, a comprehensive rewrite using TypeScript, React, and Tauri to augment the functionality and put developers first through a flexible and robust API workflow

Cata Language Compiler | *C, C++, LLVM*

- Developed a high-performance programming language and compiler that compiles to native executables
- Used a combination of Recursive Descent and Pratt parsing to parse and generate Abstract Syntax Trees (AST)
- Implemented a code generator that traverses the AST to emit LLVM Intermediate Representation (IR) code

Tangent Equation Calculator | *Python, Flask, SymPy, HTML, CSS, JavaScript*

- Created a web application with Flask, serving a REST API with a streamlined and responsive front-end
- Integrated a seamless continuous deployment pipeline of the back-end server to Vercel and the static front-end to GitHub Pages for rapid loading times
- Introduced an accurate risk mitigation strategy to substantially diminish the potential dangers associated with arbitrary code execution within SymPy's parser by walking through the expression's Abstract Syntax Tree
- Leveraged SymPy to parse and solve mathematical equations, retaining imaginary solutions for vertical line cases

Macro API | *C++, Python, Windows API, X11 API, Doxygen, CMake*

- Developed a powerful simple-to-use Macro API that has full mouse and keyboard control with 100+ enum keys
- Devised a code generator that transforms keyboard and mouse movements to C++ code, which can then be compiled to replicate the original input seamlessly
- Implemented continuous integration for builds and tests with CMake and doctest using GitHub Action workflows
- Collaborated with contributors to resolve bugs, develop comprehensive tests, and incorporate examples

EDUCATION

University of Waterloo

Sep 2023 – Present

Candidate for Bachelor of Computer Science Co-op (BCS), cGPA: 92.5%

Waterloo, Ontario

- **Core Courses (all advanced):** CS 145/146, Math 145/146, Math 147/148
- **Awards:** Faculty of Mathematics National Scholarship, President's Scholarship of Distinction