LUIGI QUATTROCIOCCHI

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EDUCATION

McMaster University | B.Eng in Software Engineering with Co-op   *Sept. 2020 - Apr. 2024*
- **Relevant courses:** Data Structures and Algorithms, Databases, Concurrent Programming, Software Design
- **Extracurriculars:** Google Developer Student Club, McMaster EcoCAR

SKILLS

Languages: C, C++, Python, Java, Bash, JavaScript, HTML/CSS, C#, SQL
Technologies: Git, GNU/Linux, GDB, GCC, GNU Make, CMake, SDL, OpenGL, VerilogHDL

EXPERIENCE

Vitruvian Engineering | Embedded System Developer   *Jun. 2018 - Sept. 2022*
- Developed firmware in C and C++ targeting SAMD and PR2040 microcontrollers and designed PCBs for internal engineering systems.
- Leveraged flow and temperature sensors to control a hydrodynamic thermal system using PID controllers.
- Deployed PHP web servers which communicated with an SQL database and over 10 vending machines to log more than 200 daily HTTP requests.
- Refactored a React and SQL codebase for a dashboard, leading to a decrease in runtime by more than 1000%.

PROJECTS

trash-lang
- A compiled and statically-typed **programming language**, written from scratch in **C**.
- Designed a context-free grammar in **EBNF** syntax for a procedural language with variables, conditions, and loops.
- Created a state-machine tokenizer and **recursive-descent** parser to transform text into abstract syntax trees.
- Generates **x86_64 assembly** to link into native **Linux** ELF executables.

OS
- A 32-bit **operating system** for x86 computers, including bootloader and kernel drivers, using **x86 assembly** and **C**.
- Features 320x200 8-bit color VGA with font rendering, PS2 mouse and keyboard support.

editor
- A cross-platform and graphical **text editor** written in **C** using **OpenGL** and **SDL**.
- Created a tile renderer which uses fragment and vertex **shaders** to render a monospace bitmap font.

ymalloc
- An implementation of **malloc** and **free** in **C** using the **Linux** syscall sbrk.
- Implemented multiple memory allocation strategies, including first-fit and best-fit.
- Utilized both implicit and explicit doubly linked list to store information about used and freed blocks of memory.

CP Solutions
- A GitHub repository of solutions to various competitive programming problems, which showcase technical skills in **data structures** and **algorithms**, using **C++**, **Python**, and **Java**.
- Solved over 500 unique problems across multiple platforms and ranked in the top 200 in Canada.

EXTRACURRICULARS

Programming Tutor   *Jun. 2020 - Present*
- Privately tutored more than 10 students in Python, JavaScript, C++, and C.
- Taught concepts such as Object-Oriented programming, front end web development, data structures, algorithms, graph theory, dynamic programming, 3D graphics, and computer architecture.