Thomas Hart

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Skills

Languages: C++, C, Java, Python, Verilog, Rust, VHDL, ARM Assembly, SQL, HTML, CSS, JavaScript
Frameworks/Libraries: Langchain, Android SDK, AOSP, React.js, Django
Tools: Linux, Git, CMake, Oscilloscope
Hardware: STM32, FPGA, Arduino, Raspberry Pi

Experience

Founder · *AI Docs* · Vancouver, BC — Jan 2024 – June 2024

- Leveraged **prompt engineering** and **fine-tuning** techniques on **LLMs** using **Python** and **Langchain** to create a tool that automatically writes documentation for codebases, enabling faster and more streamlined development.
- Won the **Overbeeke Family Entrepreneurship Excellence Award** (**$5,000**) from the University of Waterloo's enterprise co-op pitch competition out of **30+** students, recognizing the tool's impact on development efficiency.
- Engaged with potential users to identify key documentation challenges, directly influencing design decisions.

Undergraduate Research Assistant · *University of Waterloo* · Waterloo, ON — May 2023 – Aug 2023

- Collaborated with a team of researchers supervised by Professor Arie Gurfinkel to perform **formal verification** of **Rust** code using the **SeaHorn** verification framework, enhancing code reliability.
- Reduced verification time by **50%** by using alternatives to common data structures in the **Rust** standard library.
- Demonstrated **SeaHorn**'s effectiveness by writing verification jobs to find errors in legacy versions of **Rust** crates.

Software Engineer · *Peraso Technologies* · Toronto, ON — Sept 2022 – Dec 2022

- Developed a custom **XML** parsing and generation tool in **C++** to streamline **EEPROM** programming, achieving **95%** faster input speed compared to manually entry.
- Optimized the **CLI** code for **5G radio devices** and removed redundant command outputs, resulting in **20%** faster runtime, and elimination of all input errors.

Autonomous Vehicle Android Developer · *Ford Motor Company* · Remote — Jan 2022 – Apr 2022

- Leveraged hidden **AOSP Java** classes to implement a critical feature for the map application in an **in-vehicle infotainment system**, demonstrating technical agility and understanding of **OOP** concepts.
- Migrated legacy code to the latest **Android**, allowing for long-term compatibility with future development.

Projects

RISC-V Processor (Verilog)

- Developed a 5-stage pipelined **RISC-V** processor in **Verilog**, with data-forwarding and stalling to avoid hazards.
- Designed and verified memory modules and control logic, enabling efficient handling of different data sizes.

Finance Translator (Python, Django, HTML, CSS)

- Developed a web application using **Django** to simplify complex financial text using **NLP** through the **Cohere API**.
- Implemented a **trie-based search algorithm** to identify keywords in the text and provide relevant links.

Arduino Stock Ticker Display (Arduino, C++, Python)

- Developed a real-time stock ticker display using an **Arduino Uno WiFi** and connected **LCD display**.
- Made periodic calls to the **Yahoo Finance API**, allowing users to track **live stock prices** for their portfolio.

Education

University of Waterloo · BASc in Computer Engineering · GPA: 3.74 — Sept 2021 – Apr 2026

- **Relevant Courses:** Algorithms and Data Structures (**C++**), Systems Programming and Concurrency (**C**), Real-Time Operating Systems (**C**, **ARM**), Compilers (**Java**), Computer Architecture (**Verilog**)