Thomas Hart

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Skills

Languages: C++, C, Python, Java, Verilog, Rust, ARM Assembly, PostgreSQL, MySQL, TypeScript, JavaScript
Frameworks/Libraries: Langchain, Android SDK, AOSP, React.js, Django, Pandas
Tools: Linux, Git, CMake, Tableau, Metabase, DBT
Hardware: STM32, FPGA, Arduino, Raspberry Pi, Oscilloscope

Experience

Data Engineer · *RxFood* · Toronto, ON — Jan 2025 – Apr 2025

- Built a custom reporting engine using **Python** and **PostgreSQL** to automatically generate patient outcome reports for clinicians, **saving 2–3 hours** of manual work per report and improving long-term scalability.
- Added **interactive graphs and visualizations** to the clinician portal using **React.js** and **TypeScript**, improving usability and enabling actionable insights into patient health trends for **600+** clinicians.

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.

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, and eliminating logic errors.
- Achieved a **50%** reduction in verification time by using alternatives to common data structures in the **Rust** standard library, while maintaining accuracy by writing verification jobs to find errors in legacy versions of popular **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 manual entry and saving valuable engineering time and resources.
- Optimized the **CLI firmware** for **5G radio devices** and refactored redundant command outputs, resulting in **20%** faster runtime, **10%** less memory usage, more clear and concise output, and the 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** version and to a newer build system, allowing for long-term compatibility with future development and a **25%** reduction in build time.

Projects

Hardware Accelerated Stock Exchange Order Book (In Progress) (Hardcaml, FPGA)

- Building an **FPGA**-accelerated stock exchange order book using **Hardcaml** for a final year design project.
- Designing a **scalable pipeline** that handles **high-volume transactions** and load balances across multiple **FPGAs**.

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.

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 · 3.71 GPA — Sept 2021 – Apr 2026

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