THOMAS HART

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SKILLS

Languages: C++, Java, Python, C, Rust, HTML, CSS, JavaScript, VHDL, ARM Assembly, LaTeX
Frameworks/Libraries: Android SDK, AOSP, React.js, Django, scikit-learn, Cohere, LibGDX, SeaHorn
Tools: Git, GitHub, VS Code, CMake, Android Studio, Visual Studio, JIRA, Confluence
Hardware: Arduino, Raspberry Pi

EXPERIENCE

Research Assistant
University of Waterloo · May 2023 to Present · Waterloo, ON

- Collaborating with a team of researchers supervised by professor Arie Gurfinkel to verify Rust code using the SeaHorn verification framework.
- Investigating alternatives to the Rust standard library vector class to improve runtime performance of verification jobs.
- Demonstrating the effectiveness of the SeaHorn framework by creating jobs to identify critical errors in old versions of widely used Rust crates.
- Developed a custom Python script to automate the generation of boilerplate code for verification jobs, improving development times.

Software Engineer
Peraso Technologies · Sept. 2022 to Dec. 2022 · Toronto, ON

- Contributed to the development of firmware and internal tools for 5G radio devices using C++ as a member of the Device Software team.
- Designed a custom XML parsing and generation tool that streamlined the input of data into an EEPROM programming application.
- Enhanced the stability of CLI code by improving error checking and eliminating crashes caused by invalid user input.
- Revised various CLI commands to optimize output clarity and eliminate redundant information, resulting in improved usability for end users.

Autonomous Vehicle Android Developer
Ford Motor Company · Jan. 2022 to Apr. 2022 · Remote

- Built high-quality Android applications for an in-vehicle infotainment system using Java, ensuring optimal performance and user experience.
- Demonstrated technical expertise by utilizing hidden AOSP classes to successfully implement a key feature, despite minimal documentation.
- Migrated key features to the latest version of Android, enabling the adoption of new technologies and ensuring long-term compatibility.
- Followed industry best practices, applying sound development methodologies to write clean, efficient code and documentation.

PROJECTS

The Magic Glove (Raspberry Pi, Python)

- Developed an innovative, assistive glove to aid the blind and visually impaired in their daily activities.
- Implemented spatial awareness, color detection, and light detection features using Python, Raspberry Pi and an array of sensors.
- Integrated Google Cloud's text to speech API to play audio notifications through a speaker attached to the glove.

Finance Translator (Python, Django, Cohere, HTML, CSS)

- Developed a web application using Django that simplifies complex financial text using NLP with the Cohere API.
- Implemented a trie-based search algorithm to quickly identify relevant keywords in the text and provide links to corresponding definitions.
- Designed a feature to display real-time stock prices for companies mentioned in the input text, using the TradingView API.

Arduino LED Matrix Snake Game (Arduino, C, Python)

- Utilized an Arduino Uno and an 8x8 LED matrix to create a fun and engaging version of the popular game "Snake".
- Developed a Python script that listens for keyboard inputs and transmits them to the Arduino via USB cable for a seamless gaming experience.
- Optimized the program for efficient operation, ensuring the LED matrix functions as intended and gameplay runs seamlessly.

Number Converter App (Java, Android)

- Developed an Android application using Java that facilitates quick and efficient conversion of numbers between different number systems.
- Implemented features to convert between the four most frequently used number systems, enabling users to easily switch between systems.
- Designed the application with an intuitive user interface, ensuring a seamless and enjoyable experience for users.

Crypto Terminal (Python)

- Designed and developed a user-friendly Python command line application to check various cryptocurrency statistics.
- Utilized the Coin Gecko API to request real-time price data for the top 1000 cryptocurrencies, providing users with up-to-date information.
- Employed the mechanize and beautifulsoup4 libraries to scrape Minerstat, enabling users to check the current profitability of mining hardware.

EDUCATION

University of Waterloo · Sept. 2021 to Apr. 2026
Candidate for Bachelor of Applied Science in Computer Engineering | GPA: 3.83
Relevant Courses: Algorithms and Data Structures (C++), Numerical Methods (C++), Digital Computers (ARM Assembly), Digital Circuits and Systems (VHDL)