Cal Edward McArthur

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Skills

Languages: C++, Python, C, Typescript, JavaScript, Embedded C, HTML, CSS, SQL, VHDL
Technologies: React.js, Next.js, Node.js, Express.js, Vite, Firebase, MongoDB, MySQL, SQLite, FreeRTOS, Arduino
Tools: Git, Linux, Bash, Docker, Jenkins, QT, STM32, XCode, Visual Studio, Figma

Experience

BlackBerry Inc | *Applications Software Developer* **Sept - Dec 2022**

- Led the development of a full-stack C++ application by designing and implementing software architecture and an efficient process to manage NAT event reporting for the Linux kernel which was interfaced with a TypeScript front-end.
- Built a system that allows an admin access to the source IP and ports for TCP/UDP flows through their network, with a focus on maximizing throughput when persisting network events.
- Created a scalable API to allow for secure retrieval, updating, and deletion of networking data stored in a SQLite3 database.
- Developed various Typescript features including JSON web keys, JWK enrollment lifetimes, and password bypasses to improve overall runtime efficiency by over **2x** for the BlackBerry Cyclance Gateway test application.
- Pivoted web servers from HTTP to HTTPS and implemented stricter TLS certificate approvals to ensure secure data transmission, which led to an increase in endpoint security by **30%** and a timely release.

Deep Trekker Inc | *Test and Development Intern* **Jan - April 2022**

- Developed embedded C code for STM microcontrollers, improving networking security, diagnostic messaging, and PCB information reporting across the front-end and back-end interfaces for **4+** remotely operated vehicles.
- Collaborated with team members to develop an expandable and efficient automated testing system using the capabilities of the FreeRTOS kernel, GoogleTest, and a fake function framework, within an agile SCRUM environment.
- Conducted hands-on testing for **7+** underwater ROV's and their controllers while resolving software and hardware issues.
- Wrote system and unit level tests in C++ and Python, communicating with a team of developers on strategies to rectify bugs.

Interact Rotary Club | *President* **Sept 2018 - August 2021**

- Managed a group of **20+** young adults and fundraised **$9,000+ over 4 years** for various charity foundations in Ontario.
- Organized charitable events, guest speakers, and the building of a wash station for an underdeveloped community in Cambodia.

Projects

Hack Harvard - The Crimson Cube | *Typescript, Next.js, Firebase, TailwindCSS, C, Arduino, OnShape, Figma, Electrical* **October 2022**

- Developed and pitched an IoT communication aid for children with speaking issues that allows them to express their emotions non-verbally; the project included a SLS 3D printed toy, a wired Arduino that sent sensor data to a NoSQL Firebase database, and a live interactive Next.js website.
- Led all backend architecture and process design by implementing data packaging and transfer on the Arduino, database fetching and deletion from Firebase, and informatics on the live application to display sensor data in a clear and comprehensive manner.
- Collaborated on front-end design in Typescript and impacted the overall design choice for the project.

Freelance Arial Photography Website | *React.js, Vite, Typescript* **December 2022**

- Developed a responsive and user-friendly website for a small business that showcases aerial drone footage, a personalized portfolio, customer testimonials, and contact information.
- Implemented image carousels, an intuitive navigation system, and a contact form using React hooks and TypeScript.

Basketball Stat Tracking Software | *Python, Pandas, NumPy, Matplotlib* **Nov 2022**

- Developed a Python program to track and compare personal basketball statistics against professional player data fetched from the NBA API; utilized NumPy and Matplotlib to filter and display the player data.
- Accurately tracked an increase in shooting statistics of **15%** over two weeks of training.

Education

University of Waterloo **Sep 2021 – Present**
Candidate for BASc in Systems Design Engineering *Waterloo, Ontario*

- GPA: 86.22/100
- Awards: President's Scholarship of Distinction, Leslie Klein Engineering Scholarship

Interests

Stories by John Steinbeck and Tolkien, running and mountain biking, Jack Nicholson movies, backcountry camping in the wilderness, learning about space, shooting basketballs, stick and puck, learning acoustic guitar, and writing whatever comes to my mind