Callum Mackenzie

Third Year Computer Science and Statistics Student
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Education

The University of British Columbia Vancouver, BC, Canada
Bachelor of Science in Computer Science & Statistics (GPA 4.0) *Sep 2022 – May 2027*
Activities: CS Tri-Mentorship Program, UBC Recreation

Coursework: Algorithm Design & Analysis, Computer Graphics, Software Construction, Applied Linear Algebra

Experience

Embedded Software Engineer Co-op Jan – Current
General Dynamics *Calgary, AB, Canada / Remote*

- **Created robust, precise software** for critical military systems on an R&D team
- Developed **3 Linux device drivers and daemons**, informing soldiers with battlefield insights
- Added **$10,000+ in value per platform** by enabling an additional user on previously non-leveraged hardware
- Utilized **networking principles** for embedded **distributed systems** for modularity and efficiency
- **Resolved 30+ defects** in embedded projects (Qt/C++), improving reliability in safety-critical environments
- **Reduced CI/CD system runtime by 50%** on multiple pipelines with Docker, Python, Jenkins, and AI
- Set up AI infrastructure and tooling supporting **20+ team members** as well as build systems
- Shipped **scalable client functionality in .NET apps** interfacing with embedded devices & AI servers
- Created documentation and presented **demos for internal AI use cases**

Ice Hockey Official Jan – Nov 2024
Thunderbird and Todd Ice Hockey Leagues *Vancouver, BC, Canada*

- **Managed player conflicts by taking action decisively**, keeping calm, and communicating clearly

Projects

FITNET - Embedded Motion Sensing with EMG | *C, Swift, iOS, FreeRTOS, Fusion360* Feb 2025 – Current

- **Motion-tracked & analyzed body position** with custom wearables measuring EMG and IMU data
- Created **iOS app** with SwiftUI & SceneKit to **read & process device data** with optimized BLE
- Predicted movement category with **dynamic time warping KNN classification** with 98% accuracy
- Designed system **ground-up from electrical to software design**, including custom PCBs
- Utilized microprocessor with **Bluetooth Low-Energy (BLE) to communicate** with iPhone CoreBluetooth
- **Achieved 99% accuracy** in muscle activation using custom EMG circuit and accelerometer data

Deloitte ThinkTech | *React, Typescript, Javascript, Node, R, DocuSign, UIPath* Sep – Nov 2022

- Developed an **MVP for a real-world client business problem** regarding document tracking in the healthcare industry with two business and one technical teammate
- Placed **4th out of 160+ candidates**
- **Presented** solution overview for **100+ Deloitte employees & executives**, fellow competitors, and visitors
- Used UIPath RPA, DocuSign, and AWS , focusing on security to **manage sensitive records for client** company

Exvi Fitness | *Java, Kotlin, AWS, R, Android, Git* Dec 2021 - Jun 2022

- Developed a **full-stack desktop & Android application** for tracking personal workouts and sharing with others
- **Webscraped and cleaned the data of 2000+ exercises** from online datasets using Java and R
- Created a **custom login system with 2FA** using cryptography to store sensitive user data
- **Synced across devices with a serverless backend** (AWS), allowing sharing workouts with friends
- Followed **responsive UI design principles**, allowing multi-platform capability and intuitive use with Kotlin

Technical Skills

Languages: Python, C, C++, Swift, Kotlin, TypeScript, C#, Java, R, Rust, JavaScript, GLSL
Frameworks: .NET, UWP, Qt, React, Node, Maven, Gradle, OpenGL, FreeRTOS, ESP-IDF, Jetpack Compose
Developer Tools: Git, Linux, Vim, Docker, Jenkins, Visual Studio, CMake, Make, AWS, Firebase, Open-WebUI