

Abdalla Eldoumani

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EDUCATION

University of Calgary

B.Sc. Computer Science, Minor in Philosophy
GPA: 3.6/4.0 | Dean's List (2023-2024, 2024-2025)

Sep 2022 - Jun 2027
Calgary, Alberta

Relevant Coursework:

- Computing Machinery I & II (C, ARMv8 Assembly, Computer Architecture, Embedded Systems), Principles of Operating Systems, Data Structures & Algorithms, Computer Networks, Database Management Systems, Artificial Intelligence, Principles of Computer Security, Web-Based Systems, Software Engineering, Reverse Engineering

WORK EXPERIENCE

Teaching Assistant

University of Calgary

Sep 2025 - Present
Calgary, Alberta

- Guide **20 students** through a 13-week **CPSC 355** curriculum covering **computer architecture**, C, and **ARMv8 assembly**.
- Conduct hands-on **lab sessions** demonstrating **memory management**, **register allocation**, and **instruction set architecture**.
- Debug **low-level code** issues and explain complex concepts through practical examples and **step-by-step walkthroughs**.
- Evaluate **assembly programs** and **C implementations** for correctness, efficiency, and architectural best practices.

AI Training Specialist

Outlier

Oct 2024 - Sep 2025
Remote, Canada

- Evaluated **AI-generated Python code** across **500+ dual-response scenarios**, analyzing algorithm efficiency and optimization.
- Tested AI solutions for **functional correctness** and performance, documenting **comparative analysis** with technical feedback.
- Identified bugs and optimization opportunities in diverse **programming tasks** including data structures and algorithms.
- Contributed to **large-scale AI training** by assessing model responses across **Python development** patterns and best practices.

Headstarter AI

Software Engineering Fellow

Jul 2024 - Sep 2024
Remote, Canada

- Built and deployed **5 AI-powered applications** using **Python** and **Docker**, completing intensive hackathons with teams.
- Developed a capstone project serving **1,000+ users** using **React.js**, **TypeScript**, and modern web frameworks.
- Collaborated on real-world challenges requiring rapid prototyping, testing, and deployment under tight deadlines.

AI Oruba International School

Python Mentor

Jul 2021 - Jul 2022
Riyadh, Saudi Arabia

- Led programming workshops for **30+ high school students**, teaching **Python fundamentals** and algorithm implementation.
- Designed hands-on coding exercises and project-based assignments improving student programming confidence.
- Facilitated collaborative learning environment where students supported each other in overcoming coding challenges.

PROJECTS

Rust HTTP Server | Rust, Axum, SQLite, WebSocket | Solo Developer | July 2025 – Present

- Architected production-grade server handling **10,000+ concurrent connections** with **<10ms latency** and **JWT authentication**.
- Built full-text **search engine** with fuzzy matching and asynchronous job processing with **WebSocket notifications**.
- Integrated intelligent caching reducing database load by **60%**, plus **rate limiting** and SQL injection prevention.

FastMathExt | C++, Python | Solo Developer | January 2025 - Present

- Optimized **matrix multiplication** achieving **25-41% performance gains** over NumPy through cache blocking and **SIMD vectorization**.
- Engineered benchmarking suite with statistical validation across **10,000+ test iterations** for memory-constrained applications.
- Implemented **Strassen's algorithm** with task-based concurrency, reducing complexity from **O(n³)** to **O(n^{2.807})**.

Budget Buddy | Next.js, Typescript, TailwindCSS, Clerk, Vercel | Team Member/Lead | February 2024 - February 2024

- Built full-stack financial platform with **real-time stock data** integration and secure authentication for **100+ users**.
- Implemented **budget tracking**, investment projections, and financial analytics dashboard with responsive design.
- Deployed on **Vercel** with PostgreSQL database, achieving fast load times and seamless user experience.

Interactive Cybersecurity Site | HTML, CSS, JavaScript | Team Member/Lead | September 2023 – December 2023

- Contributed to developing an **educational platform**, broadening **cybersecurity knowledge** through lectures and **interactive quizzes**.
- Formulated quizzes covering **cryptography**, **hashing**, **malware**, and **privacy**, deepening users' understanding of **cybersecurity principles**.
- Authored educational content on **encryption methods**, **malware**, and **digital privacy**, offering a comprehensive learning experience.
- Established a user-friendly interface with **HTML**, **CSS**, and **JavaScript**, ensuring platform remains **responsive** and engaging.
- Created complex cybersecurity topics accessible through a **hands-on**, **interactive approach**, reinforcing theoretical knowledge with **practical applications**.

Self-Checkout Station Software Simulation | Java, JUnit, Git | Team Member September 2023 – December 2023

- Collaborated within a 20-member **team** to execute software simulation for **self-checkout station** using **Java**.
- Employed **object-oriented programming** and Java's GUI libraries to develop responsive **touchscreen interface**.
- Amplified development productivity by **30%** through maximized **version control** and collaboration using **Git**.
- Conducted comprehensive testing with **JUnit**, ensuring flawless operation and achieving **100% usability**.

TECHNICAL SKILLS

- Languages:** C, C++, Python, Java, JavaScript/TypeScript, Rust, SQL, ARMv8 Assembly
- Tools & Frameworks:** Git, Linux, Docker, React.js, Node.js, Next.js, Flask, Django, FastAPI, Spring Boot
- Technologies:** AWS, Azure, Google Cloud, PostgreSQL, MongoDB, MySQL, REST APIs, WebSocket, CI/CD, Kubernetes