

Andrew Zheng

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EDUCATION

University of Waterloo | BAsC, Computer Engineering | GPA: 3.9

Sep 2025 – Apr 2030

SKILLS

Languages: C, C++, Python, Golang, Verilog, Java, SQL, HTML, CSS, JavaScript, TypeScript, Bash

DevOps/Tools: AWS (Lambda, S3, IAM), Docker, Git, Jupyter, QEMU, Virtualization, VMWare Fusion, Linux

Libraries/Frameworks: FastAPI, React, MongoDB, Streamlit, NoSQL, REST API, Tailwind CSS, Next.js

Embedded/Hardware: Altium Designer, KiCad, CAN, UART, I2C, SPI, Oscilloscope, Logic Analyzer

PROJECTS

SageWall | ML Cloud Security System ([GitHub](#)) | AWS, Python, Streamlit, Machine Learning Dec 2025

- Architected a serverless Intrusion Detection System (IDS) deployed as a **SageMaker** endpoint using an **XGBoost** classifier, analyzing network traffic with **99.9%** classification accuracy and **<100ms** inference latency
- Engineered and automated the ETL pipeline using Lambda to transform raw network logs in S3, processing **125,000+** records from the NSL-KDD dataset and provisioning infrastructure via AWS SDK (Boto3)
- Deployed a Streamlit web dashboard for real-time system observability, secured with AWS IAM policies, using CloudWatch to monitor system health and triggering SNS security threat alerts via email

CrawlStars | Concurrent Search Engine ([GitHub](#)) | Golang, MongoDB, REST API, Concurrency Dec 2025

- Engineered concurrent web crawler with custom HTTP client using scalable producer-consumer architecture with parallel goroutines and buffered channels, processing **2000+ pages/minute** with **<15MB** memory usage
- Optimized high-concurrency pure **Golang** backend with thread-safe deduplication using sync.Map and atomic operations, enabling O(1) (constant-time) lookup for **50,000+** URLs and filtering **70%** of redundant crawls
- Developed a relevance ranking algorithm using MongoDB Atlas Search integration with aggregation pipelines and fuzzy query matching to map SEO relevance metrics to a 5-star rating system

Mangaroo | PDF-to-Manga AI Illustrator ([GitHub](#)) | FastAPI, Python, REST API, Generative AI Nov 2025

- Architected an asynchronous REST API orchestrating an agentic pipeline (**Gemini 1.5 Pro + Imagen 3**) using **FastAPI**, handling **1000+ concurrent sessions** to process **250+ page** novels and **50MB** input
- Engineered Story Bible context system with structured JSON prompting and session-scoped caching, reducing token usage by **92%** (1.4M to 100K per 100 pages) while maintaining O(1) memory complexity vs. O(n) alternatives

EXPERIENCE

Embedded Systems Designer | Waterloo Rocketry | Waterloo, ON Sep 2025 – Present

- RocketCAN Remote Arming System** ([GitHub](#)) | Safety-critical KiCad PCB
 - Engineered schematic and PCB layout for dual LiPo inputs and discrete P-MOS high-side switching topology
 - Implemented passive gate biasing for recovery system arming during MCU high-impedance failure states
- Remote Arming Firmware** ([GitHub](#)) | C Firmware for PIC18
 - Implemented low-level C firmware for **PIC18** to aggregate UART altimeter telemetry onto the **CAN** bus
 - Tested and debugged real-time ADC health monitoring and pyro continuity via logic analyzers and oscilloscopes

Hardware Designer | UW Biomechatronics Design Team | Waterloo, ON Sep 2025 – Present

- EMG Fabric Arm PCB** ([GitHub](#)) | Bionic Arm PCB in KiCad and Altium Designer
 - Spearheaded migration to **Altium**, engineering an **ESP32**-based control system with **USB-C** connectivity
 - Validated electromechanical integration by collaborating on design constraints in **SolidWorks** for seamless fit

Case Competition Coach | Self-employed Jun 2024 – Present

- Scaled self-founded coaching business from contract work to fully independent, achieving **5-figure revenue**
- Developed curriculum for 150+ secondary school students across 10+ schools, leading to 50+ international qualifiers, 30+ finalists, and 33% (4/12) of Team Ontario's **1st-place** finishes at ICDC 2024

AWARDS

1st Place World Champion (Marketing – Product Management) | DECA ICDC @ Los Angeles Apr 2024

7x National Honour Roll | University of Waterloo CEMC Mathematics Contests 2020 – 2024