

Andrew Zheng

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Education

University of Waterloo | BSc, 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, STM32, ST-LINK, CAN, UART, I2C, SPI, Oscilloscope, Logic Analyzer

Projects

SageWall | ML Cloud Security System | AWS, Python, Streamlit, Machine Learning

[GitHub](#) 

- Architected serverless IDS on **AWS SageMaker (XGBoost)** to analyze network traffic with **99.9%** accuracy and **<100ms** latency
- Automated Lambda ETL pipeline to transform **125,000+** NSL-KDD records in S3, provisioning infrastructure via Boto3
- Deployed Streamlit web dashboard secured with AWS IAM, CloudWatch, and SNS for real-time system observability alerts

CrawlStars | Concurrent Search Engine | Golang, MongoDB, REST API, Concurrency

[GitHub](#) 

- Engineered concurrent crawler using **Golang** producer-consumer architecture to process **2000+ pages/min** in **<15MB** memory
- Optimized deduplication via sync.Map to enable O(1) lookup for **50,000+** URLs and to filter **70%** of redundant crawls
- Developed relevance algorithm using **MongoDB Atlas** aggregation pipelines to map SEO relevance metrics to 5-star rating system

Mangaroo | PDF-to-Manga AI Illustrator | FastAPI, Python, REST API, Gemini/Imagen API

[GitHub](#) 

- Architected async FastAPI for **10x** concurrent session handling to process **50MB PDFs (1000+ pages)** in **<50ms/page**
- Engineered Story Bible state manager to reduce token usage by **97%** and cost from \$24 to **\$0.70** per 10K panels
- Deployed **3-layer** error architecture with singleton pattern and Vertex AI account authentication for production-grade security

FPGA Logic Processing Unit | FPGA, Verilog, Intel Quartus Prime

[GitHub](#) 

- Developed 4-bit ALU (ripple carry adders + multiplexers) on Altera MAX10 to route calculations to real-time 7-segment displays
- Designed logic processor for bit-wise operations and signal concatenation in Verilog to validate design in ModelSim Altera

Experience

Embedded Systems Developer | Waterloo Rocketry | Waterloo, ON

Sep 2025 – Present

[GitHub](#) 

- Remote Arming Board** | Safety-critical Avionics Recovery PCB
 - Engineered 4-layer KiCad PCB with PMOS high-side switching to arm remote recovery parachute via RocketCAN bus signal
 - Architected hardware fail-safe via passive gate biasing to ensure dual-altimeter redundancy during MCU Hi-Z faults
 - Implemented low-level C firmware for **PIC18** to bridge UART altimeter telemetry onto the RocketCAN bus via MCP2562
- Fuel Injector Sensor Hub** | Real-Time Propulsion Telemetry Firmware
 - Developed **STM32** drivers in C to acquire pressure telemetry via ADC and log to RocketCAN and SD Card mid-flight
 - Validated signal integrity and CAN/I2C communication protocol effectiveness using oscilloscopes and logic analyzers
- Recovery System Integration** | Polaris Launch 2026 Avionics Assembly
 - Executed integration of Polaris' most safety-critical avionics to construct unified dual-redundant system architecture
 - Validated and debugged hardware using NI automated test equipment and custom EGSE to certify flight readiness

Hardware Designer | UW Biomechatronics | Waterloo, ON

Sep 2025 – Jan 2026

[GitHub](#) 

- EMG Bionic Arm** | Bionic Arm PCB in KiCad and Altium Designer
 - Spearheaded Altium migration and Git repository initialization to engineer **ESP32** control system with USB-C connectivity
 - Verified PCB design constraints in Altium and SolidWorks to validate electromechanical integration for production

Case Competition Coach | Self-employed

Jun 2024 – Present

- Scaled self-founded coaching business from contract work to fully independent to achieve **5-figure revenue**
- Developed curriculum for **150+** secondary school students across **10+** schools to produce **50+** international qualifiers
- Coached **30+** international finalist achievers to win **25% (3/12)** of Team Ontario's **1st-place** global finishes at ICDC 2024

Awards

1st Place World Champion (Marketing – Product Management) | DECA ICDC 2024 in Los Angeles, California

Apr 2024

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

2020 – 2024