Zuhair Khan

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Education

Toronto Metropolitan University (Formerly Ryerson University) Toronto, ON

B.Eng, Computer Engineering *Expected graduation, May 2026*

- Electrical & Computer Engineering Student Society (Exec. Advisor, VP Operations, Jr. Rep, FYR)
- RUHacks 1st Place, REC 1st Place, MET Eng Comp 3rd Place
- Related Coursework: Digital Systems Eng., Advanced Algorithms, Comp Vision, Software Design & Architecture

Experience

Software Development Engineer May 2024 – July 2025

Ontario Power Generation (OPG) - Internship *Bowmanville, ON*

System C & OHD Application

- Engineered and deployed **RESTful APIs** using **Python Flask** and **pymssql** to streamline data integration across internal systems.
- Refactored legacy scripts into a structured **3-tier MVC architecture**, improving scalability and maintainability.
- Delivered a **93% reduction in data-request latency**, transforming system performance and accelerating end-user workflows.

Matrix Optimization Tool

- Re-engineered a critical work plan matrix program using **Flask**, **VBA**, and **pyodbc**, modernizing scheduling infrastructure for Darlington & Pickering's Planning & Cost Control divisions.
- Developed an algorithm for NG_M datasets that dynamically computes crew allocation (150+ crews) and task dependencies, reducing schedule generation time from **16 hours to under one minute**.

Founder / Software Engineer Dec 2025 – Present

ClippyIO *Remote*

- Built a **distributed async platform** that converts long-form media into **AI-selected short-form clips**.
- Implemented **GPU-accelerated workers** on **AWS EC2 g4dn** instances (**CUDA, PyTorch, Whisper**).
- Designed a **clip-ranking algorithm** that scores transcript segments using weighted relevance heuristics and **OpenAI-assisted semantic signals** to identify high-impact moments.
- Designed **AWS-native storage workflows** using **Amazon S3** for raw uploads, processed clips, job status artifacts, and structured result metadata.
- Architected an **asynchronous, queue-driven pipeline** using **Amazon SQS** to decouple API traffic.
- **Docker** containerized backend and worker services enforcing clean separation between API and compute layers.
- Built **FFmpeg-based media pipelines** for A/V extraction, slicing, and clip generation.
- Developed a **stateless REST API** using **FastAPI** for ingestion, job orchestration, and result retrieval.
- Deployed a **Next.js (React, TypeScript) frontend** on **Vercel** with client-side job polling.
- Implemented **production-grade networking** using **Nginx**, **HTTPS/TLS** (Certbot), HTTP→HTTPS enforcement, and centralized CORS handling at **Layer 4 (Transport)**.

Projects

QSense – Modular Smart Home IoT Platform (QClock v1) Jan. 2025 – Present

- Developed embedded firmware on **ESP32 (C++/Arduino)** integrating display rendering, device configuration, and real-time state management over UART/I2C/SPI.
- Designed a **device-agnostic backend** using **Django/Python**, exposing APIs on Render for device provisioning.
- Built a **cross-platform mobile app** (**React Native, TypeScript**) to serve as a control plane for device.
- Established a clean hardware–backend–mobile ecosystem to support team scaling and production deployment.
- Architected a **modular smart home platform** with **QClock** as the first production device.

Technical Skills

Languages: Python, C, C++, TypeScript, Java, Dart, C#, SQL, VHDL, JavaScript, Bash, MATLAB, HTML/CSS
Frameworks: FastAPI, Flask, NextJS, Flutter, React, Django, Node.js, .NET
Embedded Systems: UART/I2C/SPI, ESP32, Arduino, ModelSim, CMake, JTAG Debugging
Technologies: Git, AWS, Docker, Kubernetes, Azure, GCP, Cloudflare, Agile (Kanban), MySQL, SSMS, PowerBi
Certificates: Python AI Development: Intermediate (Skillsoft Percipio)