

Rohan Kulshrestha

rohanz@outlook.com | rohanjk.xyz | github.com/rohanz

EDUCATION

Nanyang Technological University

Bachelor of Engineering in Computer Engineering (Expected May 2028)

Singapore

Aug 2023 – Present

Raffles Institution

GCE A Levels

Singapore

Jan 2015 – Dec 2020

TECHNICAL SKILLS

Languages: Python, C++, Java, TypeScript, JavaScript, SQL, C

AI/ML: LLM Fine-Tuning (QLoRA, DPO), Evals, RAG, AI Agents & Tool Calling, OpenAI/Claude APIs, Google Gemini, LangGraph, Vector Embeddings

Web, Mobile and Audio: Next.js, React, React Native, FastAPI, REST APIs, JUCE, VST3/AU, real-time DSP

Data and Cloud: PostgreSQL, DuckDB, AWS (Lambda, DynamoDB), Google Cloud (Cloud Run/SQL/Tasks), Supabase, Docker

Tools: Git, Linux, Pydantic, Asyncio, Playwright, Pandas, NumPy, Figma

EXPERIENCE

AI Engineer Intern

HoshoAI

Jun 2026 – Present

Singapore

- Building an LLM prompt-optimization and evaluation system: an AWS Lambda (Node.js) service that scores and improves AI agent prompts using the Claude and OpenAI APIs.
- Developing eval harnesses measuring output quality and run-to-run consistency to surface regressions, with A/B testing to validate changes before shipping; backend on DynamoDB and Secrets Manager.

Software and AI Engineer Intern

AlphaGeo | [Writeup](#)

May 2025 – Aug 2025

Singapore

- Designed and built an end-to-end ETL pipeline consolidating 11,000+ data center facilities from 6+ sources (Wikidata/SPARQL, OpenStreetMap, PeeringDB, news, reports) with geospatial + fuzzy-match deduplication.
- Developed a LangGraph agent (Gemini 2.5 Pro, Pydantic structured output) that autonomously locates market reports, plus a vision pipeline (Playwright + Gemini Vision) to extract data from web-only PDF viewers.

PROJECTS

QuantLab - Trading Firm in Miniature | Python, C++, Fine-Tuning, Quant Finance | [Writeup](#)

Jul 2026

- Fine-tuned Qwen3 8B/14B (QLoRA, DPO) into a memo writer + repair model with a deterministic gate verifying every cited number: 50/50 held-out memos passed at 99.6% per-number accuracy vs Claude Sonnet 5's 99.8%.
- Engineered a deterministic C++20 matching engine (limit order book, 10.4M ops/sec, hash-verified replay) and a risk gateway (exposure caps, kill switch, append-only audit log) driving live daily paper trading at a real brokerage.
- Built a backtesting engine that makes lookahead bias structurally impossible, Kalman-filter adaptive pairs trading, and momentum/low-volatility factor strategies, measuring survivorship bias at +4.6%/yr instead of disclaiming it.

CareerSphere - AI Career Exploration App | Python, OpenAI, DuckDB | [Writeup](#)

Jun 2026

- Won Champion (1st place) at the OpenAI x AI Singapore x PyCon SG 2026 Hackathon, in a team of two.
- Built an app that turns a resume into a navigable 3D map of Singapore's job market, grounded in 2,030 official SkillsFuture roles and 88,000+ daily-refreshed MyCareersFuture job postings in an in-process DuckDB snapshot.
- Designed it so "the data decides, the AI interprets": an OpenAI tool-calling agent orchestrates while deterministic Python owns skill matching, role-fit scoring, and gap ranking (vector embeddings); deployed on Cloud Run.

BQST - Audio Mastering Plugin | C++, Real-Time Systems, Concurrency, JUCE | [Writeup](#)

Jun 2026

- Built and shipped a cross-platform native C++ application (VST3/AU/Standalone audio plugin) end to end: DSP core, custom GUI, and a signed, notarized universal macOS installer.
- Implemented the C++ DSP core from scratch (IIR shelving filters, nonlinear waveshaping for harmonic generation) on a lock-free, allocation-free real-time path with 8x oversampling; validated with pluginval at strictness 10.

YourCast - AI Podcast App | Python, Google ADK, Gemini, GCP | [Writeup](#)

Jun 2025 – Aug 2025

- Built a serverless app generating personalized 3-5 minute AI podcasts from 16,000+ daily articles (200+ RSS feeds), with semantic deduplication (vector embeddings) and multi-agent script generation on Cloud Run.

ADDITIONAL EXPERIENCE & ACTIVITIES

Specialist

Singapore Armed Forces

Jan 2021 – Jan 2023

Singapore

- Led and trained a 40-member artillery unit through live-fire operations and mission planning.

Music Production and Audio Engineering

- Composed, produced, mixed, and mastered original songs (2M+ streams); hand-built analog audio gear.