NELKIT CHAVEZ

AI & ML Engineer | MSc Data Science & Innovation (UTS) | Full-Stack Product Builder

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Work rights: Full-time now (Student visa, course completed Nov 2026) · Applying for Temporary Graduate visa (485)

SUMMARY

AI and ML Engineer building AI products that reach production: RAG systems, multi-agent LLM apps, computer vision and data pipelines. 7+ years shipping iOS, Flutter and full-stack products for enterprise and government clients. Recently deployed Horus, a live natural-language CCTV search system, and led backend and frontend of Sydney Liveability AI, named Best AI LLM Project at UTS.

TECHNICAL SKILLS

LLMs & RAG: RAG, multi-agent systems, CrewAI, LangChain, vision-language models, LLM-as-judge evaluation, prompt engineering, embeddings, vector databases (Qdrant, ChromaDB), Hugging Face Transformers, MCP
ML & Deep Learning: PyTorch, TensorFlow, Keras, scikit-learn, LSTM, CNNs, transfer learning, fine-tuning, NLP, sentiment analysis, NLTK, attention mechanisms
Computer Vision: YOLO26, multi-object tracking, MobileNetV3, ResNet50, video understanding
Reinforcement Learning: PPO, A2C, MuJoCo, Gymnasium, custom environment design
Data Science & Analytics: statistics, experimentation, EDA, model evaluation, visualisation, Pandas, NumPy, Plotly, Matplotlib, Jupyter, Streamlit
Data Engineering: Spark, PySpark, Databricks, Airflow, dbt, ELT, Medallion architecture, star schema, SQL, PostgreSQL
MLOps & Cloud: Docker, FastAPI, REST APIs, GitHub Actions, CI/CD, AWS (SageMaker, S3, EC2, RDS), Google Cloud (Cloud Composer, Cloud SQL), Supabase, Render, Railway, Oracle Cloud Infrastructure (OCI), Cloudflare R2
Full-Stack: Python, TypeScript, JavaScript, Next.js, React, Django, Astro, Node.js, MongoDB, Vitest, Playwright
GIS: PostGIS, GeoServer, GeoNetwork, OpenLayers, Leaflet, Mapbox, ArcGIS
Mobile: Swift, SwiftUI, UIKit, Flutter, React Native, Ionic, MVVM, XCTest

SELECTED PROJECTS

Horus: Natural-Language Search for Multi-Camera CCTV Footage | UTS Capstone | 2026 | cctvai.site · github.com/uts-ilab-p08/cctv-query-frontend

- Led frontend, integration, deployment and client coordination (team of 6). Built the design system, search, results workspace and conversational assistant (Next.js, React, TypeScript); RAG answers cite exact moments and jump the video there with tracked objects outlined.
- Wrote the API contract for the streaming FastAPI backend (14 tested endpoints), led full-system integration and deployed the system live. Tested the frontend with Vitest and Playwright, ran all client meetings and presented the live demo at the UTS Innovation Lab Showcase.
- Delivered, with the team, a pipeline indexing 1,955 events from 5.9 h of video across 23 cameras (96.4% consistent with MEVA annotations); metadata filtering doubled retrieval accuracy (correct video first for 19/22 questions vs 9/22; MRR 0.886 vs 0.432).

Stack: Python, Qwen3-VL-8B (MLX), YOLO26, ByteTrack, bge-base-en-v1.5, Qdrant, PostgreSQL (Supabase), FastAPI, Next.js, React, TypeScript, Vitest, Playwright

Sydney Liveability AI | Applied NLP, UTS | 2026 | sydney-liveability.nelkit.dev · github.com/Nelkit/sydney-liveability-ai

- Designed the backend architecture, FastAPI endpoints and Synthesiser agent for a multi-agent RAG app (two CrewAI crews, team of 6) ranking 656 Sydney suburbs for newcomers from Reddit sentiment, BOCSAR crime, Transport for NSW, OpenStreetMap and City of Sydney data.
- Built an in-memory cache preventing DB connection pool exhaustion and an ArcGIS-to-PostGIS ingestion pipeline. Built the entire Next.js and Leaflet frontend, with an evidence drawer of sources.
- Won Best AI LLM Project, UTS Applied NLP competition (Autumn 2026); 2.75/3 relevance, 93.3% completion.

Stack: Python, CrewAI, DeBERTa-v3, GoEmotions, ChromaDB, FastAPI, PostgreSQL/PostGIS, ArcGIS, Next.js, Leaflet

AgriFlight-RL | Reinforcement Learning, UTS | 2026 | github.com/Nelkit/agroflight-rl

- Implemented Proximal Policy Optimisation (PPO) from scratch in PyTorch (CleanRL style), trained on AWS SageMaker; it cleared all 5 levels on every seed with 0% crashes and 100% of rows completed, matching or beating a hand-designed controller (REINFORCE and A2C did not).
- Co-developed AgroDrone-v0, a custom MuJoCo and Gymnasium environment where a quadrotor flies 1.2 m over a crop row in wind (team of 3). Built the 3D viewer on my own.

Stack: Python, PyTorch, MuJoCo, Gymnasium, PPO, A2C, REINFORCE, AWS SageMaker

Crypto Price Prediction Dashboard | Advanced ML Applications, UTS | 2025 | crypto-forecast.nelkit.dev · github.com/Nelkit/crypto-predictor-streamlit

- Built the Ethereum LSTM pipeline and API in TensorFlow/Keras: validation MAE (mean absolute error) of 118.3, about 11x lower than HistGradientBoosting (1,301.9); test MAE 70.78.
- Set up repos and branching (team of 4); built the CoinGecko pipeline and caching for next-day BTC, ETH, XRP and SOL forecasts, served by one Dockerised FastAPI service per coin, first on Render and now on Oracle Cloud (OCI).

Stack: Python, TensorFlow, Keras, LSTM, scikit-learn, FastAPI, Docker, Render, OCI, Streamlit, CoinGecko API

Sydney Airbnb ELT Data Warehouse | Big Data Engineering, UTS | 2026

- Orchestrated Apache Airflow on Google Cloud Composer to load 12 months of Airbnb data and the 2016 Census into PostgreSQL on Cloud SQL: 412,122 listing-months, zero row mismatches across 12 monthly runs.
- Modelled a dbt Medallion warehouse (Bronze/Silver/Gold): 4 snapshots, a star schema with 4 SCD Type 2 dimensions and datamarts, revealing a ninefold revenue gap between local government areas.

Stack: Apache Airflow, Google Cloud Composer, Cloud SQL, PostgreSQL, dbt, SQL

NYC Taxi at Scale | Big Data Engineering, UTS | 2026

- Built a Databricks Spark pipeline over 991M raw taxi trips (975.8M after cleaning, 1.58% removed) for SQL analysis.
- Trained a PySpark MLlib Random Forest fare model that cut RMSE 64% vs a historical baseline on an unseen 2024 holdout (6.14 vs 17.06, R^2 0.924).

Stack: Databricks, Apache Spark, PySpark, Spark MLlib, SQL

Image Captioning for Blind Users' Photos | Deep Learning, UTS | 2026 | github.com/Nelkit/dl-image-captioning-at3

- Built a MobileNetV3 + LSTM captioning model on VizWiz (7,750 images), best of the team's 10 models (BLEU-1 0.592, BLEU-4 0.357), vs GoogLeNet + LSTM with Luong attention (team of 5).

Stack: Python, PyTorch, MobileNetV3, GoogLeNet, LSTM, Luong attention, VizWiz

More projects: Food101 transfer learning (Top-1 60.3% → 72.4%), Sydney Rain Prediction API, NLP of 299 parliamentary submissions, Australia Liveability Gap · nelkit.dev/en/projects

Self-hosted infrastructure: migrated all academic apps and APIs from Render and Railway to Oracle Cloud Infrastructure with Cloudflare R2 storage, after free tiers slept when idle and lacked RAM for RAG workloads.

PROFESSIONAL EXPERIENCE

Web & GIS Developer (Consultant) | Mindtech504 | Oct 2022 – Present

- Built the AgroMapas geoportal end to end for the Honduras Ministry of Agriculture (SAG) in 2022, using Django, ReactJS, OpenLayers, GeoServer and PostGIS.
- Deployed 28 reviewed changes to AgroMapas production via GitHub Actions CI/CD (Nov 2025 – Nov 2026).
- Migrated to the KoboToolbox API v2, restoring field data collection; closed 7 security vulnerabilities, automated daily backups and delivered a client-approved GeoNetwork ISO 19115-3 metadata catalogue.
- Built web and GIS apps for other clients (OpenLayers, Mapbox) and full-stack Django, ReactJS and PostgreSQL projects on AWS.

Senior Mobile Engineer | Fleet Street Development / Sumadi | Oct 2021 – Sep 2022

- Led Sumadi's first Flutter app, the company's first mobile product, defining a scalable cross-platform MVVM architecture with product and design.

Senior iOS Developer | Latin American Armored Rentals / Ryte | May 2019 – Oct 2021

- Owned and rebuilt the iOS app in Swift (SwiftUI alongside UIKit) with real-time MQTT events from the Node.js backend, cutting client-reported bugs by 90% and improving performance by 40%.
- Introduced XCTest automated testing and Crashlytics crash monitoring, reducing production incidents.

Mobile Developer | Sunray Management Group / Locstatt | Apr 2017 – May 2019

- Led end-to-end development of the Classroom Locstatt safety-training app in Swift 5, from Sketch UI design to App Store release; used at 20+ enterprise clients.

Junior Mobile & Web Developer | Aplicaciones Moviles y Digitales Amaya / Crayon Star | Jan 2016 – Mar 2017

- Worked on 12+ hybrid web and mobile projects (Ionic, Django, AngularJS), cutting delivery timelines by up to 50%.

EDUCATION

Master of Data Science and Innovation | University of Technology Sydney (UTS) | Feb 2025 – Nov 2026 | Completed

- HonduFuturo Scholar (selected from 100+ applicants)

Information Technology and Communications in Engineering | Universidad Politecnica de Ingenieria | 2011 – 2015

- Summa Cum Laude

LANGUAGES

Spanish (Native) · English (Fluent, professional working proficiency)