KALAN JARVIS-LOEWEN
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SKILLS

Languages: Python, TypeScript, Java
Machine Learning & Data: PyTorch, FastAI, NumPy, Pandas, Scikit-Learn
Backend & Systems: FastAPI, Node.js, Redis, Docker, MySQL, MongoDB
Web & Frontend: Next JS, React, Tailwind CSS
Cloud & Deployment: Google Cloud, Firebase, Vercel
Tools: GitHub, Hugging Face, n8n

EDUCATION

Queen's University - Expected May 2029

- Bachelor of Computing and Mathematics (Honours)
- 3.53/4.3 GPA, (3.86/4.3 STEM GPA)

EXPERIENCE

Design Team Member - QMIND (Queen's University AI Organization)
September 2026 – Present

- Investigating whether CLIP's image-text similarity scores reflect visual concepts humans can recognize, by optimizing images to match words ranging from concrete to abstract (PyTorch, OpenAI CLIP).
- Implemented and compared pixel-based feature visualization with CLIPDraw vector-stroke rendering; developing a hybrid pipeline that refines stroke drawings with bounded pixel-level detail.
- Co-designed a human recognition study comparing participants' four-choice accuracy against CLIP's confidence, and presented the MVP to sponsor and faculty judges at the Camp QMIND hackathon.

Freelance Full-Stack Developer - Remote
March 2025 – May 2026

- Delivered full-stack web solutions for local businesses using **Next JS** and **Tailwind CSS.**
- Architected serverless backends using **Google Cloud Functions** to handle contact form logic and API notifications, reducing hosting costs and latency.
- Managed the end-to-end SDLC, from requirements gathering and UI/UX design to DNS configuration and SEO optimization, resulting in improved client web presence.

PROJECTS

LLM From Scratch (Machine Learning) - Python, NumPy, Next JS, Hugging Face
Repository: github.com/kalandjl/llm-from-scratch
Live demo: llm-from-scratch-psi.vercel.app

- Designed and implemented a decoder-only large language model from first principles, without ML frameworks, to internalize transformer math and linear algebra.
- Built custom implementations of multi-head self-attention, layer normalization, residual connections, and autoregressive decoding.
- Trained the model on the requests library codebase; optimized training with cosine learning-rate decay and LoRA for parameter-efficient fine-tuning on consumer hardware.

Lean AI (Machine Learning) - Python, FastAI, Kaggle, Next JS, Hugging Face
Repository: github.com/kalandjl/LeanAI
Live demo: lean-ai-alpha.vercel.app/

- Built an inference pipeline using an ensemble of 11 CNN architectures (ResNet-50, EfficientNet-B3) for biometric image regression.
- Model predicts body-fat to a mean squared error of lower than 2%
- Containerized and deployed the system using Docker with a serverless backend and Next JS frontend, serving real-time predictions to users.