

SIVAKUMAR KARTHIKRAJ

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EDUCATION

National University of Singapore | B.Comp. (Hons) Computer Science, Minor in Psychology 2023 - 2027
NUS Overseas Colleges (Toronto) | Year-long overseas startup internship programme. Jan – Dec 2026

TECHNICAL SKILLS

Languages/Frontend | Python, Java, JavaScript/TypeScript, C, Dart, React, Next.js, Vue, Flutter, TailwindCSS

Backend | Node.js, Express, FastAPI, GraphQL, Celery, Knex.js, REST **Testing** | Playwright, Vitest, pytest, Mocha

Data/Infra | PostgreSQL, DynamoDB, Redis, Firebase, AWS, GCP, Docker, Kubernetes

AI/ML | LangChain, LangGraph, PyTorch, OpenCV, Qdrant, Meilisearch, Gemini API

EXPERIENCE

Trax | Software Engineer Intern Jan 2026 – Present | Toronto, ON, Canada

- Architected and shipped an end-to-end AI pipeline auditing building-permit submissions against municipal requirement checklists; hybrid dense+sparse retrieval (Qdrant + Meilisearch, RRF-fused) feeding structured LLM verdicts with page-level citations. In pilot with the City of Kitchener, ON.
- Built a 14-assertion validator for the requirements database that caught a silent regression which had disabled retrieval filtering and seal checks on 248 of 355 live requirements.
- Built an eval harness and deterministic grading engine, partnering with the company's in-house architect to define ground truth and iterate verdict quality, taking it to 84% accuracy on 25 cases and replacing subjective spot-checks as the team's release signal.
- Led migration of the analytics stack off GA4/Azure Queue onto a first-party Snowplow → Redis Streams → PostgreSQL service and replaced live Stripe-API subscription reporting with a PostgreSQL-backed endpoint, removing all runtime third-party calls from the admin dashboard.
- Built the XML ingestion pipeline for National Building Code documents (XSLT transforms) as first production contribution; the corpus Checkmate later retrieves against.

Perfingo | Software Engineer Intern Mar 2025 – Nov 2025 | Singapore

- Designed and shipped a real-time, multi-currency group bill-splitting system end-to-end across a Flutter app and a Node.js/TypeScript/DynamoDB backend, one of the app's flagship features
- Architected a materialised net-balance model on a single-table DynamoDB PK/SK design (no GSIs/scans), turning group settlement lookups into O(1) reads
- Built a decimal-precision splitting engine using largest-remainder allocation to guarantee exact-sum splits across 16 currencies with live FX rates and audit metadata.
- Built a Terms & Conditions platform with semver-versioned acceptance tracking, letting legal copy ship without an app-store release, and reworked acceptance checks from per-session to a single call at login.

COURSEWORK AND PROJECTS

CAPTCHA Recognition | CS4243 Computer Vision Project | [Demo](#) | [Code](#) Nov 2025

Built a ResNet-style CNN with a BiLSTM head and CTC loss for variable-length sequence prediction (OpenCV preprocessing and augmentation); raised sequence accuracy from 35% to 55.6% over 14 systematic iterations.

Klingon Heads | Attained Orbital – Apollo 11 (Advanced) accreditation from NUS SoC | [Code](#) Aug 2024

Trained and fine-tuned Transformer and GRU sequence-to-sequence models for English/Klingon translation, served through a React/Firebase web app with quizzes and flashcards.

Hackathons | NUS Health Hack 2024 (Semi-finalist) · Hack4Good 2025 · LifeHack 2024

CO-CURRICULAR ACTIVITIES

NUS Computing AI Society | Co-founder and Vice President Aug 2024 – June 2025

- Co-founded NUS Computing's first AI-focused CCA, growing to 150+ members
- Managed a 10-member committee, organising workshops, hackathons and industry partnerships to build engagement and promote AI education

NUS Outdoor Adventures Club | Vice President (Cycling) Sep 2023 – June 2025

Planned and led 8 night-cycling routes across Singapore for 30+ riders, owning route safety and on-road support