# Caleb Kan

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## Education

**Imperial College London** — London, United Kingdom
**Degree**: Bachelor of Engineering – BEng, Computing — Sep 2023 – Jun 2026
**Grade**: First-Class Honours (Predicted)

## Experience

**Software Engineer Intern** — Jul 2025 – Sep 2025
**HubSpot** — London, United Kingdom
**Software Engineer Intern** — Aug 2024 – Oct 2024
**Midas Advisory** — London, United Kingdom

- Automated non-operating expense data processing for top 15 U.S. banks using open-source LLMs, web scraping, APIs, and parallelisation with Ray, cutting processing time from hours to minutes and boosting accuracy to 97%.
- Implemented a Milvus vector database with high-dimensional embeddings using the BAAI/bge-m3 model. Built a scalable architecture for future ML model and data source integration, enhancing efficiency.
- Developed a hybrid search system combining Milvus's RRFRanker and dual LLMs: a small LLM achieving 93% filtering accuracy and Hermes-3-8B-GGUF for schema-based reporting. Improved company market intelligence and analytics.

**Research Intern** — Jul 2023 – Jul 2023
**Department of Computer Science, City University of Hong Kong** — Hong Kong

- Achieved 92.5% accuracy in GDPR compliance detection across 400+ websites by developing a GDPR compliance checker extension with a distinguished professor, utilising BeautifulSoup4, LangChain, and OpenAI's LLM for automated analysis.
- Increased daily active users by 45% and improved user-reported compliance understanding from 3.2 to 4.7 on a 5-point scale by designing a user-friendly interface displaying website GDPR compliance status, enhancing data privacy awareness.
- Boosted successful data erasure request rate by 150%, processing 100+ requests in the first month by creating a one-click feature for automated data erasure requests, streamlining the exercise of GDPR rights.

## Projects

**WACC (Compiler Project)** | Scala — Jan 2025 – Mar 2025

- Developed a WACC compiler frontend, building a lexer and parser for syntax analysis, creating an abstract syntax tree representation, implementing a symbol table for semantic checks, and designing descriptive error reporting to aid debugging.
- Implemented the backend using TAC intermediate representation with ARM32/AArch64 support, architecture-specific dependencies, code optimisations (constant propagation, folding, control flow analysis), and a standard math library.

**PintOS (Operating Systems Project)** | C — Oct 2024 – Dec 2024

- Enhanced OS kernel functionality by implementing timer-based thread synchronisation, advanced priority scheduling with priority donation, and the BSD scheduler, ensuring efficient multitasking and thread management.
- Developed a virtual memory subsystem, including paging, frame management with second-chance eviction, and supplementary page tables, enabling support for user programs, memory-mapped files, and stack growth.

**ARMv8 Emulator, Assembler, and Visualiser** | C — May 2024 – Jun 2024

- Engineered a cycle-accurate ARMv8 emulator and two-pass assembler, implementing precise register, memory, and instruction management including robust error handling in compliance with ARMv8 specifications.
- Developed a SDL2-based GUI for real-time emulation visualisation, featuring drag-and-drop assembly parsing and dynamic rendering of CPU states, registers, memory maps, and ALU.

**AI Research Agent** | Python — Aug 2023 – Sep 2023

- Developed a AI research agent using LangChain, OpenAI's LLM, Serper API, BeautifulSoup4, and X API for automated search, web scraping, cited summaries, and content posting. Integrated MongoDB Atlas for geolocation tracking.
- Implemented a Streamlit web app enabling anyone to use the AI research agent, integrating geospatial visualisation to map worldwide usage using geolocation data stored in MongoDB Atlas. Analysed engagement patterns of 70+ global users.

## Honours and Awards

**1st Place – G-Research London Coding Challenge 2024**
Issued by G-Research

- Achieved First Place among 40+ contestants in the G-Research London Coding Challenge, a 3-hour programming contest where participants compete to achieve the highest score on a given problem.

## Skills

**Languages**: **Native**: English, Mandarin, Cantonese
**Programming Languages**: C, Haskell, HTML/CSS, Java, Kotlin, Prolog, Python, Scala, SQL
**Databases**: Firebase, Milvus, MongoDB, MySQL
**Frameworks**: Django, Flask, LangChain, Streamlit
**Libraries**: BeautifulSoup4, Matplotlib, NLTK, NumPy, OpenCV, Pandas, Playwright, PyTorch, Ray, SciPy, Selenium, SymPy
**Developer Tools**: CI/CD, Docker, GDB, Git, Google Colab, Hugging Face, JetBrains, Linux, Ollama, Valgrind, VS Code