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 — Aug. 2024 – Oct. 2024
Midas Advisory — London, United Kingdom

- Automated non-operating expense data processing for top 15 U.S. banks by developing an app integrating 20+ data sources via open-source LLMs, web scraping, and APIs. Leveraged Ray for parallel data processing, reducing time from hours to minutes and increasing accuracy from 85% 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

PintOS | 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 in C, implementing precise instruction management and 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, NoSQL — Jul. 2023 – Aug. 2023

- Developed a Python 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 a geospatial visualisation pipeline to map worldwide usage using MongoDB Atlas geolocation data. 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 · NoSQL · Python · SQL
Frameworks: Bootstrap · Django · FastAPI · Firebase · LangChain · Milvus · MongoDB · MySQL · Streamlit
Libraries: BeautifulSoup4 · Matplotlib · NumPy · OpenCV · Pandas · PyTorch · Ray · SciPy · SymPy
Developer Tools: Atom · GDB · Git · Google Colab · Hugging Face · JetBrains · Ollama · Unix · Valgrind · VS Code