Caleb Kan

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Education

Imperial College London London, United Kingdom
Degree: Bachelor of Engineering – BEng, Computing (Artificial Intelligence and Machine Learning) Sep. 2023 – Jun. 2026
Grade: First-Class Honours (Predicted)

Work Experience

Research Intern Jul. 2023 – Jul. 2023
Department of Computer Science, City University of Hong Kong | Python Kowloon, Hong Kong

- Collaborated with a distinguished professor to develop a GDPR compliance checker browser extension, utilising web scraping (BeautifulSoup4) and LangChain with OpenAI's LLM for automated analysis.
- Implemented a user-friendly interface to display GDPR compliance status of websites, enhancing user awareness of data privacy practices.
- Designed and integrated a one-click feature enabling users to automatically request data erasure from websites, streamlining the exercise of GDPR rights.

Projects

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

- Designed and developed a robust ARMv8 architecture emulator and two-pass assembler in C, accurately simulating CPU operations, memory, registers, program counter, and flags, fully adhering to the ARMv8 instruction set.
- Implemented an efficient fetch-decode-execute pipeline, seamlessly processing and executing instructions from binary files, precisely replicating ARMv8 processor behavior, utilising advanced string parsing and instruction construction algorithms.
- Developed a GUI interface using the SDL2 library in C, allowing users to drag and drop assembly files for visualisation of the execution process, displaying the graphical architecture and real-time changes in registers, memory, ALU, flags, and program counter.

Chess AI | Kotlin Dec. 2023 – Jan. 2024

- Developed a Chess AI algorithm in Kotlin to play a pawn race game, implementing comprehensive game logic and a terminal-based GUI with ASCII board representation.
- Created an intuitive user interaction system where players input moves, ensuring validity and providing feedback for any invalid moves, facilitating an engaging user experience.
- Utilised the minimax algorithm with alpha-beta pruning for AI decision-making, delivering an efficient and challenging opponent, demonstrating advanced skills in AI programming, algorithm optimisation, and game development.

AI Research Agent | Python, NoSQL Jul. 2023 – Aug. 2023

- Engineered an AI-driven web research agent using Python, LangChain, and OpenAI models, integrating BeautifulSoup4 for web scraping to generate keyword-based summaries with citations.
- Developed Twitter API integration for automated content posting, and implemented geolocation tracking with MongoDB Atlas for secure GPS coordinate storage, enabling comprehensive usage analytics.
- Contributed to a global visualisation project, leveraging collected geolocation data to plot worldwide AI agent usage, facilitating data-driven insights into geographical reach and user engagement patterns.

Technical Skills

Languages: **Native**: English · Mandarin · Cantonese
Programming Languages: C · Haskell · HTML/CSS · Java · Kotlin · Python · SQL
Frameworks: Bootstrap · FastAPI · Firebase · Flask · LangChain · MongoDB · MySQL · PostgreSQL · SQLite
Libraries: Keras · Matplotlib · Numpy · OpenCV · Pandas · SciPy · Scikit-learn · TensorFlow
Developer Tools: Android Studio · Atom · BitBucket · CLion · Git · GitHub · GitLab · GNU Debugger · Google Colab · IntelliJ · Overleaf · PyCharm · Unix · Valgrind · Visual Studio · Visual Studio Code · Xcode