AKILESH JAYAKUMAR

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Education

University of Wollongong, Faculty of Engineering and Information Sciences — Singapore, SG
Bachelor of Computer Science – BCS, Big Data and Cyber Security — *Oct 2022 – Jun 2026*

Singapore Institute of Management (SIM Campus) — Singapore, SG
Diploma of Education, Information Technology — *Oct 2021 – Sep 2022*

Experience

Home Team Science & Technology Agency — Singapore, SG
AI Engineer Intern — *Apr 2024 – Oct 2024*
Tech Stack: Python (FastAPI), Gradio, LangChain, Docker, Celery, Redis, Qdrant, CUDA, PyTorch, Azure ML Studio
- Engineered and containerised RAG and RAGAS pipelines with open-source LLMs from HuggingFace.
- Improved context recall and precision by 90% by integrating the HyDE retriever, enhancing document retrieval relevance.
- Refactored system code to enable custom prompts and few-shot learning, delivering more tailored LLM outputs.
- Configured a microservice architecture to integrate the microservices across the GenAI stack.
- Curated benchmarking datasets by automating YouTube scraping and transcription, supporting STT model training efforts.

Central Provident Fund Board — Singapore, SG
AI Engineer Intern — *Dec 2024 – Apr 2024*
Tech Stack: Python, Streamlit, OpenAI, LangChain, Microsoft Power Automate, Microsoft Excel
- Developed a GenAI application to analyse employee comments, posts, and reviews, delivering sentiment insights for HR.
- Researched and fine-tuned prompt templates with GPT models to enhance sentiment analysis accuracy.
- Automated test case generation using zero-shot and few-shot prompting techniques to evaluate sentiment analysis.
- Automated report generation for HR, providing quick access to key metrics and trends.

Projects

NES CatalystX Hackathon 2024 | Source Code | Live Site — *Oct 2024 – Oct 2024*
Tech Stack: Python, Streamlit, LlamaIndex, Milvus, NVIDIA NIM Microservice
- Our team pitched and showcased a GenAI tutoring application that supports dyslexic students with context-rich explanations.
- Allows multimodal inputs and incorporates TTS, STT & STS functionalities to enhance accessibility and learning support.

LangGraph Agentic Chatbot | Source Code | Live Site — *Oct 2024 – Oct 2024*
Tech Stack: Python, Gradio, LangGraph, Tavily, OpenAI
- Developed an LLM Agent capable of answering user queries by searching and retrieving real-time information from the web.

Next.js LLM Chatbot | Source Code | Live Site — *Apr 2024 – Apr 2024*
Tech Stack: Next.js, TypeScript, Tailwind CSS, Vercel AI SDK
- Created a ChatGPT-style chatbot to explore and experiment with Vercel AI SDK.

Skills

Frameworks: LangGraph, LangChain, LlamaIndex, Next.js
Languages: Python, SQL, JavaScript/TypeScript, HTML/CSS
Databases: Neo4j, MongoDB, Qdrant, Oracle
DevTools: LangSmith, Docker, Git