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EDUCATION

Nanyang Technological University, Singapore   Aug 2022 - Jun 2026 (Expected)
Bachelor of Computing (Computer Science)
- Expected Honours (Distinction)

INTERNSHIP EXPERIENCE & WORK EXPERIENCE

Synapxe, Singapore   Jan 2025 - Aug 2025
Data Science & Artificial Intelligence Intern
- Designed and implemented a proof-of-concept dual-store retrieval pipeline (PostgreSQL + MongoDB) for LightRAG, evaluated feasibility, query performance and scalability for production deployment.
- Enhanced a Retrieval Augmented Generation (RAG) FAQ Chatbot with a hybrid LLM-powered question bank matching and decision system, reducing average response latency by 73% from 30s to 8s.
- Led multi-attribute text classification project on unstructured data using local LLMs to ensure data privacy using (4B-27B; Gemma 3/DeepSeek-R1 Distill/Qwen 3), achieved ~ 80% accuracy held-out evaluation.

iStaging, Taiwan   May 2024 - Jul 2024
Artificial Intelligence Engineer Intern
- Developed a Generative AI voice and text chatbot leveraging AWS Transcribe, Bedrock, Polly, and Translate, supporting end-to-end speech-to-speech through research.
- Enhanced RAG techniques to optimise search capabilities using AWS Bedrock Agents powered by Claude 3 Haiku while maintaining a low end-to-end latency from speech-to-text (STT) input to text-to-speech (TTS) output.
- Co-developed JavaScript-based interface widget to create a voice and text assistant integrated with AWS Bedrock services.

ACADEMIC PROJECTS & HACKATHONS

Nanyang Technological University, Singapore   Aug 2025 - Nov 2025
Multi-Disciplinary Project | Embedded & CV Lead
- Embedded/Robotics: Unblocked a stalled development cycle by overhauling the STM32 firmware stack; implemented a new H-Bridge motor driver for direction + speed control (replacing legacy PWM-only logic), enabling stable, precise navigation.
- Hardware Abstraction: Reverse-engineered pin mappings for a new PCB revision and remapped firmware to resolve critical I/O conflicts that prevented system operation.
- Computer Vision: Fine-tuned YOLOv11s on a curated dataset for real-time detection; achieved 100% accuracy (6/6 targets) in competition runs, including a challenging edge case with > 93% confidence.
- Raspberry Pi (RPi): Co-developed the RPi communication layer linking STM32, servers, and an Android tablet.

TikTok TechJam - JurAI | Tech Lead   Aug 2025
A RAG-powered multi-agent compliance deep research system   https://github.com/lcwlouis/techjam-2025
- Ideated and led a team of 5 to build a PoC regional feature compliance multi-agent deep research checker using Google Agent Development Kit, Chroma with LangChain Tools and SearXNG search engine.
- Utilised an ensemble LLM jury system to reach a consensus to improve decision consistency (reduce single-model variance) for final verdict of feature compliance.

Chinese University of Hong Kong, Hong Kong   Sep 2024 - Dec 2024
Introduction to Internet of Things Project - ZenSpine
- Prototyped an IoT-based posture-corrector wearable powered by Arduino Nano that monitors sitting posture and delivers real-time reminders via vibration and beeping; extended concept to include haptics guided "breathing exercise"
- Defined data pipeline and analytics plan by converting raw sensor streams into actionable insights (poor-posture duration + sedentary streaks) and estimating ingestion at ~ 70-100MB/day

Nanyang Technological University, Singapore Jan 2024 - May 2024
Software Engineering - MacTaxi | Backend Lead https://github.com/lcwlouis/Mactaxi-SWE
- Architected backend infrastructure using Express.js, Node.js and MongoDB, while ensuring scalable and maintainable code by following design patterns.
- Designed and deployed secure RESTful APIs with integrated JWT authentication, ensuring data privacy and access.
- Streamlined debugging and integration by establishing Postman collections as single source of truth for API contracts.

Nanyang Technological University, Singapore Feb 2023 - May 2023
Introduction to Data Science & Artificial Intelligence - Predicting If A Movie Will Win An Oscar
- Performed data cleaning and analysis on TheMovieDB data to optimise the creation of better models.
- Applied Decision Tree, K-Nearest Neighbour and Random Forest algorithms with RandomOverSampler, SMOTE and ADASYN to identify the highest accuracy in predicting winners.

PERSONAL PROJECTS

Dominic (Telegram Chatbot) https://github.com/lcwlouis/tele-bot-dominic
A Telegram Chatbot designed to replicate a human participant in a group chat
- Utilised Google Agent Development Kit to power the bot's styling, response, state management and smart summaries, allowing for natural, realistic looking replies to group chat users.
- Designed and engineered timing systems, innovative prompting, handling of messages and memory to mimic human behaviour.

LEADERSHIP & CO-CURRICULAR ACTIVITIES

Nanyang Technological University, Singapore Sep 2022 - Sep 2023
Hall 7 Council - Publications Secretary
- Led a team of 19 subcommittee members and captured photos and videos of residents' activities, collaborating with other office holders to create lasting memories for residents.

SKILLS & INTERESTS

Languages: English (Native), Cantonese (Native), Mandarin (Professional)
Programming: Python, Java, C, JavaScript, TypeScript
Embedded & Robotics: Arduino Nano, STM32, Raspberry Pi, Firmware Debugging
AI/ML: PyTorch, YOLO, LangChain, LightRAG, Ollama, Google Agent Development Kit, Azure AI, AWS Bedrock
Data: PostgreSQL, MongoDB, Azure Cosmos DB, Pandas, Scikit-learn
Backend & DevOps: FastAPI, Express.js, Node.js, Next.js, REST APIs, Docker, Linux, Cloudflare, Azure, AWS, Postman, Git
Interests: Photography, Homelabs (Proxmox, Linux, Docker, Networking), Technology, Volunteering, Live Music