Michael Hoon Yong Hau

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Education

Singapore University of Technology and Design Sep. 2022 – May 2026
Bachelor of Engineering, Engineering Systems and Design, Business Analytics Specialisation *Singapore*

Experience

AI Engineer Intern Mar. 2024 – Dec. 2024
DSO National Laboratories *Singapore*

- Designed a Retrieval Augmented Generation (RAG) pipeline for assisting researchers with internal workflows and complex multi-hop queries, significantly reducing man-hours required to conduct initial research & policy analysis.
- Implemented a Multi-Agent collaborative LLM system, leveraging Knowledge Graph database for agentic retrieval and semantic understanding, significantly improving reasoning capabilities compared to vanilla RAG pipelines.
- Designed system architecture for end-to-end RAG application with LangGraph and Ollama for agent orchestration, Neo4j for building dynamic Knowledge Graphs, MinIO S3 and PostgreSQL for persistent storage.
- Ensured compatibility with a scalable, secure, and reliable containerised production environment using Docker.

Data Analyst Intern Jan. 2024 – Apr. 2024
Poh Tiong Choon Logistics Ltd. *Singapore*

- Worked on Supply Chain analytics, analysing cross-department delivery driver datasets to derive insights and optimize business strategies. Identified key areas for improvement in scheduling and boosted driver utilisation rates by 20%.
- Developed end-to-end automated data pipeline solution for cleaning and analysis with bash scripts, integrating existing database system with Python and Power BI dashboard, significantly reducing working man-hours.

Projects

LepakLah! | *Python, FastAPI, MySQL, Docker, Kubernetes* Aug. 2024 – Sep. 2024

- Developed a Flutter based, cloud deployed mobile application as part of Dell InnovateFest, a public-good hackathon to combat social isolation among the Elderly. Represented University, and won 3rd place award.
- Integrated an LLM system to produce personalized workshop ideas for activity center based on existing data, and Stable Diffusion image model to create visual samples of activities. Models deployed on NVIDIA NIM platform.
- Designed system architecture, containerised application backend with Docker and managed with Kubernetes, ensuring scalability and efficiency on a cloud-native environment. Deployed on Red Hat OpenShift platform.

MRP Backend System | *Python, SQL, Docker, Microsoft Azure, Airflow* Aug. 2024 – Sep. 2024

- Designed and implemented a backend system for Materials Requirement Planning (MRP) for a supply chain project, optimizing inventory management by forecasting material requirements and automating workflows.
- Developed an end-to-end ETL pipeline with Python, SQL, Azure Cloud Platform, and orchestrated automated DAG workflows with Apache Airflow. Back-end microservices containerised with Docker, validated data with Pydantic.
- Integrated system with Azure SQL database to store and retrieve data on Microsoft Azure Cloud Platform, enabling scalable and secure cloud-based data storage.

Transportation Analytics | *R, Discrete Choice Modelling, Econometrics* Aug. 2024 – Aug. 2024

- Internal Machine Learning Kaggle Competition, developed Discrete Choice models for transportation analytics on a General Motors dataset, to predict consumer choices among bundles of safety features in cars.
- Developed and tested multiple models in *R* such as Multinomial Logit, Mixed Logit, Random Forest, and XGBoost, validating model results and performance on a private test set using a cross-entropy loss metric.
- Fine-tuned model with hyperparameter grid search and introduced stacking techniques such as Meta-Learning to implement a soft-voting classifier, obtaining 2nd place overall. Discussed model interpretability with SHAP values.

Skills

Languages: Python, R, SQL, Julia, LaTeX, Go/Golang
Tools: Git, Docker, Kubernetes, Linux/Bash, Ollama, Microsoft Azure Cloud, Apache Airflow, Neo4j, MinIO S3
Libraries/Frameworks: LangChain, HuggingFace, Pandas, NumPy, scikit-learn, FastAPI, Firebase, tidyverse (R)