

Zeyu (Dennis) Wang

Phone:
0414035766

Email:
denniswang0722@gmail.com

Address: U2015, 65 Dudley
Street, West Melbourne, 3003

Linkedin:
www.linkedin.com/in/zeyu-wang-a18206268

RESEARCH / INTERN EXPERIENCE

Sound Event Tagging Project Internship

MicroCode Electronics Co, Ltd, Nanjing, Jiangsu

Jan 2025 - Mar 2025

- **Audio Analysis and Classification:** conducted audio analysis for raw audio files with Librosa, built and trained convolutional neural network (CNN) for audio tagging using Keras and audio features (MFCCs)
- **Model Deployment Pipeline:** converted keras models to RKNN models for deployment on NPUs, validating inference consistency on embedded Linux system (Ubuntu) with scripted test cases; automated the conversion and testing workflow and documented full steps for client's further testing

Conversational AI Research Assistant

Melbourne Data Analytics Platform (MDAP)

Jul 2024 - Nov 2024

- **Prototype AI web chatbot:** developed a legal document Q&A web chatbot with Retrieval-Augmented Generation (RAG) using Streamlit and LangChain, with GPT and Llama as model options

RELEVANT PROJECT

RAG and AI Agent Independent Research

<https://github.com/dennnnnnnnnnis/llm-related>

Mar 2025 - Present

- **Multi-retrieval and Vector Databases:** Adapted both document-based retriever (BM25) and vector retriever for document retrieval; evaluated the pros and cons for FAISS, ChromaDB and Weaviate
- **Video / Audio Input:** Utilised huggingface model for speech-to-text conversion before feeding to RAG
- **Query-to-SQL Generation:** Integrated Vanna.ai's RAG framework to train on schema and documentation, enabling natural-language-to-SQL generation for seamless database querying
- **Pre-retrieval Query Optimization:** Implemented query rewrite, expansion and query decompositions
- **Post-retrieval Contextual Compression:** Listwise rerank, embedding filter and chain filter with LangChain
- **Multimodal Filtering:** ColQwen2 as retriever to filter image-like documents, SmolVLM for answer queries
- **Plan-and-execute AI Agent:** Built a plan-and-execute AI agent from scratch with LangGraph and OpenAI API, with the ability to use customized tools for function calling (MCP) and generate analysis report
- **Automated Agent workflow:** Constructed AI agent workflow with n8n and voice agent with Elevenlabs

Full Stack Web Development

<https://github.com/dennnnnnnnnnis/COMP30022-ACT20-TEAM01>

Aug 2023 - Nov 2023

- Built a Student Request Portal in a cross-functional team following the Agile methodologies
- **Backend Development:** Implemented REST APIs with Spring Boot (Java), automated deployment and code changes via CI/CD pipelines (Git)
- **Database Management:** Managed relational databases through MySQL workbench and MyBatisPlus framework, which simplifying database access and take control of the SQL queries
- **Testing:** Wrote unit tests under Spring boot framework; conducted integration tests through Postman for APIs and features implemented
- **Frontend development:** Developed staff interface with Vue3.js and AntDesignVue component library

COMPETITION

AI Text Generation Detection Competition

<https://github.com/dennnnnnnnnnis/COMP90051-A2> | Rank: 2/77

April 2025 - May 2025

- Given generated texts as lists of tokenised indices, applied BoW and bi/tri-grams BoW for processing; with data cleaning, feature engineering and data augmentation steps such as masked indices, low frequency words removal, combined with calculated numeric features
- Domain Adaptation with multi-task learning for 2 datasets from separate domains
- Adapted out-of-fold cross validation; SMOTE and test time augmentation for dealing with class imbalance; implemented auto encoder in PyTorch for dimension reduction

Kaggle: Eedi - Mining Misconceptions in Maths / WSDM - Multilingual Chatbot Arena

<https://github.com/dennnnnnnnnnis/Kaggle-competitions/tree/main>

Nov 2024 - Dec 2024

- Fine-tuned Gemma-2-9b and Qwen-2.5-14b models with QLoRA using Huggingface transformers and trainer libraries; enhanced understanding in PEFT training and quantization of LLMs
- Mastered skills in training embedding models and reranker models such as Qwen3 and BGE models; synthetic data generation with LLM and prompt engineering to boost performance

ShapeStack Physical Reasoning Competition

<https://www.kaggle.com/code/denniswang07/physical-reasoning-project>

Aug 2024 - Sep 2024

- Performed image segmentation and background removal on ShapeStack dataset, applied transfer learning with pre-trained models to make classification
- Enhanced understanding in leveraging pre-trained VGG, Inception, ResNet from Keras; utilised Pytorch for building InceptionV4 model, and YOLO-v9 for shape segmentation and classifying the stacking height

Retrieval-based Fact-checking System

https://github.com/dennnnnnnnnnis/COMP90042_2024 | Rank: 7/120

April 2024 - May 2024

- Applied data preprocessing using NLP techniques on 1 million evidences and thousands of claims
- Adapted several vectorizing techniques such as Tf-IDF, BM25, BoW etc; constructed a bi-encoder model with padding, embedding and LSTM layers using Keras and TensorFlow; combined with top-k embedding similarities

EDUCATION

Master of Information Technology | Artificial Intelligence

University of Melbourne, Melbourne

Mar 2024 - Jun 2025

- **Relevant Coursework:** Natural Language Processing, Computer Vision, Statistical Machine Learning, Software Processes and Management, Software Project
- **Weighted Average Mark:** 80 | First Class Honours

Bachelor of Science | Computing and Software System

University of Melbourne, Melbourne

Mar 2021 - Dec 2023

- **Relevant Coursework:** Machine Learning, Computer System, Design of Algorithms, IT Project, Software Modelling and Design, Object-Oriented Software Development
- **Weighted Average Mark:** 83 | First Class Honours

SKILLS

- **Programming Languages** (in order of proficiency): Python | Java | SQL | R | JavaScript | C
- **Software Project Tools:** Git, Confluence, Trello, Agile, Docker
- **Coding Tools:** Cursor, Copilot, VsCode, Trae
- **Software Design Frameworks:** Spring Boot, Flask, React, Vue3, Node.js
- **Machine Learning / AI Libraries:** TensorFlow, PyTorch, HuggingFace, Scikit-learn, Numpy
- **Cloud Platforms:** GCP, Amazon Bedrock, Cloudflare (Workers and AI Bindings, deployment of LLM-based application <https://hello-ai.denniswang0722.workers.dev/ui>)
- **Spoken Language:** Mandarin (Native), English (Professional)

VOLUNTEER

VCE Maths Tutor

Step Education + QS School

Jan 2021 - Nov 2024

- More than 3 years of experience teaching students across diverse age group, high school students been taught all achieved a VCE of 90+
- Coupled with exceptional ability to communicate with different age group of people, as well as strong skill to deliver presentations in multiple occasions