CHIA HUI YEN

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EDUCATION

CARNEGIE MELLON UNIVERSITY May 2026
Master of Science in Computational Design **Pittsburgh, PA, USA**
Relevant Courses: Machine Learning in Production, Principles of Software Construction, Data Structures for Application Programmers, Introduction to Deep Learning, Web Applications Development

TSINGHUA UNIVERSITY June 2024
Bachelor of Architecture **Beijing, China**

RELEVANT EXPERIENCE

Applied AI Engineer Intern June 2025-August 2025
Lennar Corporation **Remote/San Francisco, USA**

- Architected scalable FastAPI microservices with object-oriented design supporting multimodal AI workflows, processing 1000+ images with hybrid search (semantic + keyword + reranking) in 240 seconds through async batch processing and efficient API orchestration.
- Built high-performance vector database infrastructure using FAISS with O(1) metadata lookup and hybrid retrieval strategies, enabling real-time semantic search across construction domain knowledge with sub-second query response times.
- Engineered end-to-end NLP pipeline processing construction conversations into structured data reports using few-shots classification, K-means/HDBSCAN clustering, and RAG framework with LangChain integration, achieving 20k+ text embeddings in under 300 seconds.
- Optimized ML system performance through asyncio implementation and concurrent OpenAI's API calls, delivering measurable precision/recall improvements on production-scale noisy text data while maintaining system reliability.

PROJECT EXPERIENCE

UniNest – AI-Powered Housing Search Engine | *Carnegie Mellon University* April 2025

- Architected and implemented a full-stack housing web application utilizing FastAPI, PostgreSQL, and React with Next.js, featuring AI-powered recommendation algorithms using customized scored-based metrics to deliver personalized housing suggestions based on user preferences.
- Engineered advanced image analysis capabilities by integrating OpenAI's API to extract architectural features from property images, implementing secure user authentication with JWT, and deploying to AWS cloud infrastructure (EC2, RDS, S3) with CI/CD pipelines and Docker.
- Designed intelligent preference extraction systems analyzing user behaviors across multiple channels (chat interactions, browsing patterns, image uploads) to continuously refine tenant-property matching accuracy

3Ts - 3D Architecture Model Generative AI Model | *Carnegie Mellon University* April 2025

- Collaborated within a team to research, design, and implement a novel 2D sketch-to-3D model generation pipeline using a Vision Transformer (ViT) architecture and triplanar representations for architectural applications.
- Contributed to the development of an encoder-decoder model leveraging a pre-trained DINOv2 (ViT) encoder and a custom Transformer/CNN-based decoder (PyTorch) to synthesize 3D-aware triplanar feature maps from input sketches.
- Developed the 3D reconstruction module to convert generated triplanar representations into surface meshes using the Marching Cubes algorithm (trimesh, Python).

Memory Cartography - AI-Driven Spatial Memory System | *Carnegie Mellon University* April 2025

- Built a full-stack system for personalized memory mapping of architectural and urban environments, integrating content-based filtering, TF-IDF vectorization, GPT image detection and cosine-similarity to enhance spatial and visual memory retrieval.
- Engineered a React TypeScript frontend with adjustable memory weighting controls, connected to a FastAPI backend leveraging GPT-4o for synthetic memory generation to optimize embedding-based similarity search.

AWARDS & SCHOLARSHIP

Carnegie Mellon University Architecture Merit Scholarship 2024-2025

SKILLS

Programming Languages: Python, Java, JavaScript, HTML, CSS
Frameworks & Libraries: FastAPI, Django, PyTorch, OpenCV, Next.js, React, MongoDB, Git, REST APIs
Cloud & DevOps: AWS (EC2, S3, RDS), Docker, CI/CD, OAuth, CORS, Asyncio, API Testing (PyTest)
Machine Learning & AI: Vision Transformers (DINOv2, ViT), CLIP, OpenAI API, Triplanar Representations, Embedding Similarity Search, FAISS, NLP, Computer Vision