

CHIA HUI YEN

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EDUCATION

CARNEGIE MELLON UNIVERSITY

Master of Science in Computational Design

Relevant Courses: *Inquiry into Computational Design, Data Structures for Application Programmers, Introduction to Deep Learning, Web Applications Development*

May 2026
Pittsburgh, PA, USA

TSINGHUA UNIVERSITY

Bachelor of Architecture

June 2024
Beijing, China

RELEVANT EXPERIENCE

Architectural Robotics Research Assistant

School of Architecture, Carnegie Mellon University

September 2024–December 2024
Pittsburgh, PA, USA

- Conducted research and proposed design of customized **3D binder jet printer with robotic arms** specifically for processing construction and demolition (C&D) fines, enhancing printing efficiency under the guidance of Professor Joshua Bard.

Research Assistant

Department of Building Science and Technology, Tsinghua University

December 2023–May 2024
Beijing, China

- Engineered a pipeline for woven structures using **Kangaroo, Grasshopper, and Python**, enabling efficient prototyping and large-scale simulations. Transformed 2D metal pipes into complex 3D-curved forms, integrating 3d-twisted metal rods and metal pipe systems for a few 4m × 4m × 3m digital fabrication installations.

PROJECT EXPERIENCE

HorizonHome – AI-Powered Housing Search Engine | Carnegie Mellon University

April 2025

- Developed an experimental housing recommendation system leveraging building data from **web scraping**. Created a **full stack web application** with a Python backend using the **FastAPI framework** and a frontend with **HTML and CSS**.
- Utilized **OpenAI CLIP** for image-based property search and personalized recommendations using machine learning models. Deployed the system on **AWS** for scalability, with **OAuth** for secure user authentication and thorough testing using **PyTest**.

Generative AI Model for 3D Architectural Form Generation | Carnegie Mellon University

April 2025

- Built a **Variational Autoencoder (VAE)** using **PyTorch** to generate 3D architectural forms from 2D sketches, leveraging triplane representations method of 3D. Implemented Neural Field Diffusion and built encoder-decoder models from scratch to construct 3d model from triplane and optimize 3d model generation accuracy.
- Generated synthetic dataset by using **grasshopper3d** and leveraging pre-trained model from Hugging Face to produce quality dataset of 3d models for training, to ensure delivering realistic model results aligned with architectural standards.

Weaving Structure Automation and Optimization System | Tsinghua University

June 2024

- Applied **human-centered design principles** from firsthand installation experience to identify inefficiencies in weaving structure assembly, leading the development of **automated fabrication solutions** that enhanced scalability, precision, and streamlined complex workflows.
- Developed automated fabrication system by **Python-based data analysis on structure simulation result** to advance the installation sequence of bending-active weaving structures. Implemented **C++-based serial communication** to control Inkjet Printhead Controllers, Arduino, stepper motors, and encoders, **reducing installation time by over 33%** in real-world applications.

AWARDS & SCHOLARSHIP

Carnegie Mellon University Architecture Merit Scholarship

2024-2025

Tsinghua University-Malaysia Outstanding Undergraduate Students Scholarship

2018-2023

SKILLS

Programming Language: Python, Java, HTML, CSS, JavaScript

Tools and Frameworks: Adobe Creative Suite, Blender, Arduino, AutoCAD, Rhinoceros 3D, Grasshopper 3D, Kangaroo, Unity, SketchUp, OpenCV, Django, Pytorch, Git, AWS, FastAPI

Expertise: Digital Fabrication, Automation, 3D printing, Computational Design, 3D Modeling, Generative Modeling

Languages: English (IELTS 7.5), Chinese, Malay, Cantonese