Ching-Yu Hsu

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Education

National Taiwan University (NTU)   **Sept. 2021 - Present**
BACHELOR OF SCIENCE IN ENGINEERING - ELECTRICAL ENGINEERING (EE)   *Taipei, Taiwan*

- Overall GPA 4.25/4.3, Overall Rank 5/268, 3x Academic Excellence Award, 1x Presidential Award
- Relevant Coursework: Machine Learning*, Computer Vision*, Deep Learning for Computer Vision*, Reinforcement Learning*, Security and Privacy of Machine Learning*, Software Engineering*, Database Management System*, Computer Architecture, Operating System, Data Structure, Algorithms, Web Programming, Linear Algebra, Discrete Math

* denotes graduate-level course

Research Experience

Vision and Learning Lab, NTU   **July 2024 - Present**
ADVISOR: PROF. YU-CHIANG FRANK WANG   *Taipei,Taiwan*

- **Topic: Efficient Vision Language Models** *[Details]*
  - Researching efficient Vision Language Models (VLMs) for Visual Question Answering (VQA) tasks on images and videos
  - Integrated motion vectors into **LLaVA**, reducing over **90%** of tokens during training
  - Studied over 30 recent papers on token merging and token pruning and implemented a brand-new token pruning method

Speech Processing and Machine Learning Lab, NTU   **July 2023 - Present**
ADVISOR: PROF. HUNG-YI LEE   *Taipei,Taiwan*

- **Topic: Automated Co-Evolutionary Framework for Guarding Prompt Injections** *[Details]*
  - Devised a GAN-like framework to automatically generate prompts to defend against malicious prompt injection attacks
  - Achieved a **20% enhancement** in True Positive Rate (TPR) with only **2% decrease** in True Negative Rate (TNR)
  - **co-first author** paper under review

Publications

[1] Ting-Chun Liu*, **Ching-Yu Hsu***, Kuan-Yi Lee, Chi-An Fu, Hung-yi Lee: "AEGIS: Automated Co-Evolutionary Framework for Guarding Prompt Injections Schema" (under review) *[Paper]*

* denotes co-first authors

Work Experience

CyberLink Corp. *[Company Website] [Details]*   **July 2025 - Present**
CLOUD COMPUTING RESEARCH AND DEVELOPMENT INTERN   *Taipei,Taiwan*

- Hosted a **n8n** server to automate the health-check on **300+** servers within **20 seconds**, achieving **90%** speed improvement
- Developed an AI-driven full-stack product with over **20** AI features on photo / video / audio editing
- Experienced full Software Release Life Cycle from pre-alpha, alpha, release candidate (RC), to golden master (GM)

KKCompany Technologies *[Company Website] [Details]*   **July 2024 - June 2025**
DATA ENGINEER INTERN   *Taipei, Taiwan*

- Built a natural language query system for BigQuery using **RAG** and multi-LLM conversational workflows, achieving a **5%** improvement in accuracy against other open source text-to-SQL projects
- Built an automated data orchestration system using **Apache Airflow** and **dbt**, reducing manual effort by **95%**
- Managed cloud resources using **Terraform** for scalable and **100%** repeatable deployments

Teaching Experience

AIA 1390: Introduction to GenAI and ML *[Course Link]*   **Fall 2025**
TEACHING ASSISTANT (INSTRUCTOR: PROF. HUNG-YI LEE)   *Taipei, Taiwan*

- Developed and deployed an **AI grading system** to perform automated model evaluation for **1100+** students
- Built an automated **n8n** pipeline for weekly system backups, real-time resource monitoring, and structured Docker log collection
- Performed load testing via **Locust** to optimize throughput and latency across concurrent users

CommE 5052: Deep Learning for Computer Vision *[Course Link]*   **Fall 2025**
TEACHING ASSISTANT (INSTRUCTOR: PROF. YU-CHIANG FRANK WANG)   *Taipei, Taiwan*

- Developed an image generation assignment using **Diffusion** and **ControlNet**
- Assisted over 130 students in learning deep learning techniques in computer vision after the course

NTUEE Programming Course, NTU *[Details]*   **Summer 2025**
INSTRUCTOR   *Taipei, Taiwan*

- Developed a **Python AI Agent** integrating Google Calendar and Gmail via **Gemini** and GCP with natural language commands
- Introduced no-code AI Agent in **Zapier** to integrate Google Sheets, Gemini, and Google Search for automated travel itinerary generation
- Taught over **320** learners, ranging from high school students to working professionals

EE 5184: Machine Learning *[Course Link]*   **Spring 2025**
Teaching Assistant (Instructor: Prof. Hung-Yi Lee)   *Taipei, Taiwan*
- Developed a Transformer/LLM assignment from scratch using **Gemma**
- Automated the grading of assignments by Gradescope and detected plagiarism by Moss

NTUEE camp Teaching Group, NTU *[Details]*   **Summer 2022**
Instructor   *Taipei, Taiwan*
- Delivered lessons on machine learning fundamentals to more than **100** high school students
- Guided students in implementing a **speech recognition** system via Convolutional Neural Network (CNN)

Academic Projects

Multimodal Perception in Autonomous Driving *[Details]*   **Fall 2024**
Deep Learning for Computer Vision Course
- Fine-tuning LLaVA for Autonomous Driving Scenarios using **LoRA** accompanied with **YOLO** detection and **Depth Anything** model
- Boost Image QA performance by **60%** on complex autonomous driving scenes

Water Intake tracking Coaster *[Details]*   **Fall 2024**
Embedded Systems Course
- Developed a smart coaster on an **STM32** microcontroller to track daily water consumption using a gyroscope and Bluetooth Low Energy (BLE)
- Designed a Flutter application to connect with the device via BLE, store data in SQLite, and send hydration reminders
- Achieved a low error rate of **5.8%** in estimating water intake, compared to actual consumption measured by weight difference

LLM-Enhanced Database Management System *[Details]*   **Spring 2024**
Database Management System Course
- Developed a database management system enhanced with LLM capabilities
- Utilized OpenAI's **Whisper** to transcribe audio files and applies **LangChain** to extract information from unstructured data to the database

Competitions

Landsat Surface Reflectance Tracking System *[Details]*   **Fall 2024**
2024 NASA International Space Apps Challenge - Honorable Mention
- Built a Landsat Surface Reflectance data tracking system with real-time statistics using the Google Earth Engine API
- Developed a Next.js frontend and a **FastAPI** backend, deployed on **Google Cloud Run** for scalable access

CaRPG: in-car RPG game on smart windows *[Details]*   **Spring 2024**
2024 MakeNTU - 1st place of AUO Enterprise Award
- Led a 5-member team to build an RPG game system dynamically generated by **GPT4** and a shooting game to entertain users during travel
- Developed a Flutter mobile application with a FastAPI backend and MongoDB database to display the RPG game
- Designed a monster-shooting game with Pygame and implemented **PyTorch**-based gesture detection with a **90% accuracy**

Honors and Awards

- **Honorable Mention**, 2024 NASA International Space Apps Challenge
- **1st Place of AUO enterprise AWARD**, 2024 MakeNTU
- **Finalist**, 1st Taipei City Dashboard Hackathon
- **TASA Special Award**, 2023 NASA International Space Apps Challenge
- **2nd Place of MediaTek enterprise Award**, 2023 MakeNTU
- **3x Academic Excellence Award**, 2021 Fall, 2022 Spring, 2024 Fall
- **Presidential Award**, freshman year

Technical Skills

Languages / Frameworks   C, C++, Go, Python, FastAPI, Flask, Gin, JavaScript, TypeScript, React.js, Next.js, Flutter, Assembly, MATLAB
Machine Learning / AI   PyTorch, TensorFlow, JAX, scikit-learn, XGBoost, HuggingFace, RAG, n8n, Zapier
Data / Cloud Tools   SQL, MySQL, SQLite, PostgreSQL, BigQuery, MongoDB, Airflow, dbt, GCP, AWS, Terraform

Extracurricular Activity

EEvolution   **Sept. 2023 - Present**
Founder   *Taipei, Taiwan*
- Led a team of over 30 members to organize corporate workshops (BenQ, Line), host 2 company visits, and coordinate Corporate Sharing Sessions (Amazon, Google, NXP, WorldQuant, Dell), connecting organizations with students and fostering hiring opportunities

NTUEE Table Tennis Club   **July 2023 - June 2024**
General Affairs   *Taipei, Taiwan*
- Managed administrative tasks, account book, and equipment for club activities and competitions