Jerome Hsu

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Highlight:
Deep Learning
Video Understanding
NLP & Search
Large-scale Systems

Experience

Professor Jennifer Sun's Lab, Cornell Bowers CIS — Undergraduate Researcher
Feb 2025 – Present

- Designed a 5000-line PyTorch framework for modular video model evaluation (action recognition, temporal reasoning).
- Rebuilt core features of DeepMind's Video Reader in PyTorch in **2 months**, accelerating a process that took a full research team **2 years**.
- Co-first author on NeurIPS 2025 dataset submission; open-source release planned.

National Science and Technology Council, Taiwan — NLP Research Intern
Summer 2025

- System designed and implemented in first **2 weeks** outmatched the performance and flexibility of **1.5 years** of previous development.
- Guided teammate with robust engineering practices and teamwork skills.
- Laid down the foundational architecture of AI-enhanced retrieval system in the national library's digital transformation initiative, providing guidelines for clean future improvements.

SmartSearch Project, Cornell Data Science (5% Acceptance) - Project Team Leader
Spring 2025

- Led a team of student engineers in the design and implementation of **SmartSearch**, an intelligent search engine for GitHub repositories.
- Built end-to-end pipeline integrating repository indexing, code snippet retrieval, semantic ranking, and contextual summarization using LLMs.
- Project awarded **Best Project of the Semester** among all Cornell Data Science teams for innovation, usability, and technical depth.

Bubbleye.ai, Taipei — Data Scientist
Jun 2023 – Dec 2023

- Designed predictive lifetime value algorithms for high-dimensional mobile user acquisition data across time and geography.
- Built a parametric time series smoothing framework that captured complex revenue progression patterns from sparse observations.
- Created interactive visual diagnostics for performance validation over 1000+ campaign factor combinations.
- Supported multimillion-dollar campaigns for clients including Playvalve and Playtika.

Intelligent Information Service Lab, NCU — AI Researcher
Sep 2021 – May 2023

- Published a two-stage NLP and econometrics paper on COVID-19 lockdown sentiment in the Q1-ranked *Journal of Medical Internet Research*.
- Led the end-to-end development of neural models and regression pipelines;

Education

Cornell University — B.A. Computer Science, Mathematics
Aug 2024 – Jun 2028
GPA: **4.2 / 4.3**

Software Contribution & Publications

SearchGym — Composable Design-Space Engine for Hybrid RAG Systems

- Built a platform defining a typed algebra over retrieval components (search engines, rerankers, chunkers, embedders), enabling structured exploration and instantiation of valid system variants.
- Developed a custom state and image management system akin to Docker/Kubernetes, allowing reliable creation, activation, and reuse of modular system instances.
- Separated control and data planes via an internal API that mirrors modern orchestration models — with runtime state isolation, object lifecycle control, and reproducibility guarantees.
- Integrated with a live monitoring interface to enable informed benchmarking, human feedback collection, and system evolution under unified configuration semantics.
- Planned to release as a system paper along with open source code.

WildFins — Scalable Video Training Framework for Video Model Experimentation

- PyTorch-based framework for large-scale training and evaluation of video models, with full support for multi-part, long-duration wildlife footage.
- Clean modular design separates model definition, data loading, and evaluation, allowing reproducible experimentation and rapid iteration.
- Powers the NeurIPS 2025 dataset submission on in-situ animal behavior (under review), used to benchmark a new video dataset in marine biology.

Simulating Artificial Life *Cornell University, CS2112 Final Project*

- Built a real-time multithreaded ecosystem simulation with language interpreter, parser, and JavaFX GUI. Team achieved **highest score** among 100 honors students for robust, modular, and concurrent system design.

Increased Online Aggression During COVID-19 Lockdowns *Journal of Medical Internet Research (Q1), First Author: Hsu, JT; Tsai, RT*

- Two-stage study using transformer-based NLP and difference-in-differences econometrics to analyze shifts in sentiment under lockdown policy variation across the USA.

LivingStones Multiplayer Game

- Developed a full-stack multiplayer game supporting 200+ concurrent players at a summer camp, built with React, Django, and SQLite. Included real-time team mechanics, quizzes, and interactive maps.

Skills

Programming: Python, C++, Java, JavaScript, Typescript, Bash, SQL
Frameworks: PyTorch, React, Nodejs, Django, Postgres, Git, OpenCV, scikit-learn
Topics: Machine Learning, Deep Learning, NLP, Distributed Systems, Time Series, Video Understanding

Awards

Taipei City First Place Research Award — Taipei City Government
Top 50 — Taiwan Olympiad in Informatics (TOI) National Team Selection
Top 30 — Taipei High School Programming Competition
Top 40 / 3000 — Taiwan National Math Olympiad
Regional Champion — Taiwan Math League
Distinction — Australian AMC Senior Division
Asia Pacific Mathematics Olympiad — National Delegate

Languages

Mandarin (Native), English (Native Proficiency)