Hua-Hsuan Liang

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Education

Columbia University **Aug. 2024 – Dec. 2025**
Master of Science in Computer Science *New York, NY*

- GPA: 3.875 / 4.0
- Appointed as a Course Assistant for the *Artificial Intelligence* course (Summer 2025)

National Cheng Kung University **Sep. 2019 – Jun. 2023**
Bachelor of Science in Computer Science and Information Engineering *Tainan, TW*

- GPA: 4.08 / 4.3
- Awarded the **Academic Excellence Award** (2019)

Experience

Research Assistant, Columbia University **Sep. 2024 – Present**
Robotic Manipulation and Mobility Laboratory (ROAM Lab) *New York, NY*

- **VibeCheck** | *Python, ROS2, Machine Learning, Data Analysis*
  ◦ Designed and implemented a ROS2-based framework integrating an acoustic sensor, computer, and UR5 robotic arm for real-time data collection and processing.
  ◦ Developed and optimized ML models for acoustic data analysis, achieving **90% accuracy** in object recognition tasks.
  ◦ Built a high-fidelity simulation environment to train robotic policies using **reinforcement learning (RL)** and **imitation learning (IL)**, improving performance before real-world deployment.
- **SpikeATac** | *Python, ROS2, Reinforcement Learning, Imitation Learning*
  ◦ Trained RL policies in simulation for **finger-gaiting manipulation** tasks.
  ◦ Collected expert rollouts and trained a **behavior cloning (BC)** policy in the real world.
  ◦ Fine-tuned the BC policy with **Soft Actor-Critic (SAC)** using human-labeled trajectories, achieving stable manipulation of fragile objects (e.g., eggshells).

Research Assistant, National Cheng Kung University **Sep. 2023 – Jun. 2024**
Dependable Computing and Networking Research Lab *Tainan, TW*

- Implemented **deep reinforcement learning (DRL)** models, including DQN, DDPG, and MP-DQN, for computational resource management.
- Built a scalable Python server as a Docker image and deployed it using **Kubernetes (K8s)** and **Docker Swarm**.
- Stabilized the experimental environment, achieving a **90% reliability rate** across tests.

Publications

VibeCheck: Using Active Acoustic Tactile Sensing for Contact-Rich Manipulation

- *K. Zhang*, *D. Kim*, *E. T. Chang*, **H. Liang**, Z. He, K. Lampo, P. Wu, I. Kymissis, M. Ciocarlie.
- *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2025)*

SpikeATac: A Multimodal Tactile Finger with Taxelized Dynamic Sensing for Dexterous Manipulation

- *E. T. Chang*, *P. Ballentine*, *Z. He*, D. Kim, K. Jiang, **H. Liang**, J. Palacios, W. Wang, I. Kymissis, M. Ciocarlie.
- *Under review*

Extracurricular activities

Delegate Reviewer, IEEE Robotics and Automation Letters (RA-L) **Jun. 2025**
Poster Presenter, Northeast Robotics Colloquium (NERC) **Oct. 2025, Ithaca, NY**