Hua-Hsuan Liang

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Experience

Tangent Robotics **May 2026 – Present**
Research Engineer Intern *New York, NY*

- Develop **real-world robot learning** methods for contact-rich manipulation using imitation learning, offline RL, and online fine-tuning.
- Built an **offline-to-online RL pipeline** combining expert demonstrations, previous rollouts, and newly collected robot data.
- Improved manipulation success from approximately **55% to 70%** through additional demonstrations and feedback-guided RL.
- Developed a **residual Q-learning framework** with pretrained critics, critic ensembles, action chunking, and sparse rewards.

Columbia University **Sep. 2024 – 2026**
Research Assistant, ROAM Lab *New York, NY*

- **SpikeATac — Dexterous Tactile Manipulation**
  - Trained RL and behavior-cloning policies for **finger-gaiting and in-hand manipulation** using multimodal tactile sensing.
  - Fine-tuned real-world policies with **SAC and human feedback** for stable manipulation of fragile objects.
- **VibeCheck — Acoustic Tactile Manipulation**
  - Built the **ROS2 learning and control pipeline** integrating acoustic tactile sensors with a UR5 robot.
  - Developed tactile classifiers with approximately **90% accuracy** and learning pipelines for contact-rich manipulation.
- **Human-Feedback Policy Fine-Tuning**
  - Developed an **RLHF-inspired robot policy fine-tuning pipeline** using human-labeled robot trajectories.
  - Combined demonstrations, offline data, and feedback-guided RL to improve behavior-cloned policies.

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

- Developed **DQN, DDPG, and MP-DQN** methods for dynamic computational-resource allocation.
- Modeled RL-based resource scaling using queueing-system dynamics under varying workloads.
- Built scalable Python services with **Docker, Kubernetes, and Docker Swarm**, achieving approximately **90% experimental reliability**.

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.
IEEE International Conference on Robotics and Automation (ICRA 2026)

Education

Columbia University **Aug. 2024 – Dec. 2025**

Master of Science in Computer Science *New York, NY*

- GPA: **3.90 / 4.0**
- Course Assistant, **Artificial Intelligence**, Summer 2025

National Cheng Kung University **Sep. 2019 – Jun. 2023**

Bachelor of Science in Computer Science and Information Engineering *Tainan, Taiwan*

- GPA: **4.08 / 4.3**
- **Academic Excellence Award**, 2019

Technical skills

Robot Learning: Reinforcement Learning, Imitation Learning, Offline RL, Behavior Cloning, SAC, TD3, Residual RL
Robotics: ROS2, Dexterous Manipulation, Tactile Sensing
Programming: Python, C/C++, PyTorch, NumPy
Systems: Docker, Kubernetes, Linux, Git, ClearML

Research service

Delegate Reviewer, IEEE Robotics and Automation Letters (RA-L) Jun. 2025
Poster Presenter, Northeast Robotics Colloquium (NERC) Oct. 2025
Poster Presenter, IEEE ICRA 2026 Jun. 2026