

Jiaying Fang

+1-650-387-8733 | jyfang@stanford.edu | jiaying-fang.com

EDUCATION

- **Stanford University** 09 2023 - 06 2025
Master of Science in Electrical Engineering Stanford, California
 - GPA: 4.18/4.00 Specialization: Robotics, Machine Learning, and Signal Processing
- **Hong Kong Polytechnic University** 09 2019 - 06 2023
Bachelor of Engineering (Honours) in Electronic and Information Engineering Kowloon, Hong Kong
Minor in Applied Mathematics
 - GPA: 4.01/4.00 (Ranked 1st) Specialization: Robotics and Signal Processing
 - Most Outstanding Student of Faculty of Engineering
- **McGill University** 01 2022 - 08 2022
Exchange Semester Montreal, Canada
 - GPA: 4.00/4.00

EXPERIENCE

- **Interactive Perception and Robot Learning Lab, Stanford University** 02 2024 - Present
Graduate Research Assistant Stanford, California
 - **Supervisor:** Prof. Jeannette Bohg
 - Designing and implementing a cross-embodiment scheme to zero-shot transfer a policy trained on videos of humans performing a task to a robot. To be submitted in January 2025, aiming for **Robotics: Science and Systems (RSS) 2025**.
 - Evaluated Reinforcement Learning methods on robotics tasks that require fast reactive motions in Mujoco. This project is funded by **Toyota Research Institute**.
 - Conducted joint torque feedback analysis on a large-scale robotics dataset - **DROID dataset**. Presented important rules of haptic data collection in future large-scale distributed robotics dataset at Stanford cross-labs robotics meeting. [[Slides](#)]
- **Intuitive Surgical** 06 2024 - 09 2024
Machine Learning Intern Sunnyvale, California
 - Designed and implemented an end-to-end deep learning-based 3D gaze estimation algorithm. The algorithm is robust to head motions, and it improves the gaze estimation performance by **84.5%**.
 - Generated more than **100k** synthetic images with suitable domain randomization in Blender for gaze estimation training.
 - Designed real-world gaze estimation data collection pipeline and conducted data collection. Conducted detailed analysis and visualization of the dataset.
 - Implemented a semi-auto labeling tool for pupil localization and segmentation using SAM2.
- **Collaborative Haptics and Robotics in Medicine Lab, Stanford University** 09 2023 - 01 2024
Graduate Research Assistant Stanford, California
 - **Supervisor:** Prof. Allison Okamura
 - Designed and Implemented a force-aware autonomous tissue manipulation model using imitation learning with da-Vinci Research Kit (**dVRK**). The task completion rate of autonomous tissue retraction increased **50%** with haptic sensing.
 - To be submitted to **IEEE Robotics and Automation Letters (RA-L) in December 2024**.
 - Presented force-aware autonomous surgery at Stanford Human-Centered Artificial Intelligence Conference 2024. [[Poster](#)]
- **China Telecom AI** 06 2023 - 08 2023
Computer Vision Algorithm Intern Beijing, China
 - Co-led the team in the **ICCV'23** Open Fine-Grained Activity Detection Challenge. [[Challenge](#)]
 - Won third place on the video activity recognition track and second place on the video activity detection track.

• Prof. Mak's Lab, Hong Kong Polytechnic University

09 2022 - 03 2023

Undergraduate Research Assistant

Kowloon, Hong Kong

- **Supervisor:** Prof. Man-Wai Mak
- Implemented deep speaker embedding for speaker verification with a domain loss to alleviate the languages mismatch problem.
- The performance of the ECAPA-TDNN (pre-trained using the English dataset) on the unlabelled Chinese dataset has **improved by 10%** with the MMD-based domain loss. Won the **Honours Project - Technical Excellence Award**. [\[Report\]](#)[\[Code\]](#)

• Dynamics, Estimation, and Control in Aerospace and Robotics Lab, McGill University

06 2022 - 08 2022

Undergraduate Research Assistant

Montreal, Canada

- **Supervisor:** Prof. James Forbes
- Designed a finite-horizon LQR control of UGV for path tracking.
- Robot Operating System was used during implementation. The state of UGV was represented as an element of direct Euclidean isometries, $SE(2)$. [\[Report\]](#)

• Autonomous Systems Lab, Hong Kong Polytechnic University

05 2021 - 10 2021

Undergraduate Research Assistant

Kowloon, Hong Kong

- **Supervisor:** Prof. Yuxiang Sun
- Developed a deep learning-based integration of monocular visual odometry and multi-object tracking.
- Deployed deep optical-flow estimation for localization and 3D object detection models for 3D multi-object tracking.

PROJECTS

• Learning a Deep RL Policy for Automated Needle Manipulation on Surgical Robots

03 2024 - 06 2024

Stanford University

[\[Report\]](#)[\[Code\]](#)

- Developed a **deep reinforcement learning** policy for needle reaching, tracking and picking in surgical RL environment.
- Evaluated the performance of vision-based and state-based RL policy.
- Designed and implemented a two-stage vision-based needle manipulation RL policy, which converges within **50k** steps, while other end-to-end policies struggle to converge even in 80k steps.

• Force-Aware Adaptation: What can we do if the force sensor is unavailable?

09 2023 - 12 2023

Stanford University

[\[Report\]](#)[\[Slides\]](#)

- Developed a system that learns and distills the force/torque information during training, then deploys the policy when the force/torque sensor is not available.
- Implemented a **Teacher-Student** system for **haptic feedback** distillation.
- The adapted policy can reach a **70%** success rate even when the force/torque sensor is unavailable. Without the two-stage distillation system, the success rate is only 20%.

• Automatic Path Following, Loading, and Unloading Mobile Cart

01 2023 - 06 2023

Hong Kong Polytechnic University

[\[Slides\]](#)

- Worked with students from Mechanical Engineering Department together to build this group project. We built from scratch an **automatic mobile cart**.
- Designed the system block diagram of this mobile cart.
- Implemented the path following control and extraction of odometry information from encoder. Evaluated the result in Gazebo before roll-out in real world.

PUBLICATIONS AND POSTERS

[1] Alaa Eldin Abdelaal, **Jiaying Fang**, Tim N. Reinhardt, Jacob A. Mejia, Tony Z. Zhao, Chelsea Finn, Jeannette Bohg, and Allison M. Okamura. (2024). **Towards Force-Aware Autonomous Robotic Surgery**. (Manuscript in preparation).

[Poster. 1] Alaa Eldin Abdelaal, **Jiaying Fang**, Tim N. Reinhardt, Jacob A. Mejia, Tony Z. Zhao, Chelsea Finn, Jeannette Bohg, and Allison M. Okamura. (2024). **Force-based Robot Learning from Demonstration for Soft Tissue Manipulation**. In *Stanford Institute for Human-Centered Artificial Intelligence (HAI – Five)*.

SKILLS

- **Programming Languages:** Python, Java, C++, C, MATLAB, R
- **Operating Platforms** Linux (Ubuntu), Raspberry Pi, STM32, Arduino
- **Software Tools:** PyTorch, TensorFlow, Jax, ROS, dVRK, Pandas, Matplotlib, Scikit-learn, Neo4j, Git, Docker, LaTeX, Blender, Mujoco, Gazebo, AutoCAD, SolidWorks
- **Hardware Skills:** 3D Printing, Circuit Design, Prototyping

HONORS AND AWARDS

- **Honour Project - Technical Excellence Award** 06 2023
Hong Kong Polytechnic University [\[Link\]](#)
 - This award aims to recognize final-year students who excel in their Honours Project.
 - Sole recipient of the award in 2022/23.
- **Outstanding Student Award of Faculty of Engineering** 12 2022
Hong Kong Polytechnic University [\[Link\]](#)
 - A prestigious annual honor awarded to a **single** distinguished final-year undergraduate student within the Faculty of Engineering, Hong Kong Polytechnic University.
 - This award aims to award full-time final-year students who excel in both academic and non-academic pursuits during their studies.
 - Media coverage: [\[HK01\]](#)
- **Scholarship on Outstanding Performance** 12 2021
H.K.S.A.R. Government [\[Link\]](#)
 - This award aims to recognize outstanding local and non-local students studying Hong Kong.
 - The scholarship is \$80,000 HKD a year.
- **Dr. Wong Tit-Shing Student Exchange Scholarship** 08 2021
- **Professor Leung Tin-pui Memorial Scholarship** 05 2021

LEADERSHIP & VOLUNTEER EXPERIENCE

- **Academic Mentor to Junior Undergraduates** 10 2021 - 12 2021
Hong Kong Polytechnic University
 - Provided guidance and academic support to junior students in engineering.
- **Mentor for Underrepresented Middle-School Students in Hong Kong and Africa** 12 2020 - 03 2021
Hong Kong Polytechnic University
 - Taught online classes about new technologies to underrepresented students in Hong Kong and Africa.

PROFESSIONAL SERVICE

- **Reviewer of 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)**

LANGUAGES

Languages: English (Proficiency level), Mandarin (Proficiency level), Cantonese (Limited)