

# Jiaying Fang

+1-650-387-8733 | [jyfang@stanford.edu](mailto:jyfang@stanford.edu) | [jiaying-fang.com](http://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 Specialization: Robotics and Signal Processing
- **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 **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 **RAL** around 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

[**Poster. 1**] Alaa Eldin Abdelaal, **Jiaying Fang**, Tim N. Reinhart, 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 Human-Centered Artificial Intelligence at Five Conference*.

## 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

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- **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* [\[Link\]](#)
  - DRLD
- **Dr. Wong Tit-Shing Student Exchange Scholarship** 08 2021
- **Professor Leung Tin-pui Memorial Scholarship** 05 2021

## LEADERSHIP & VOLUNTEER EXPERIENCE

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- **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

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

## LANGUAGES

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