Jiaying Fang

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Education

- **Stanford University** — California, USA
  Master of Science - Electrical Engineering; ***GPA: 4.18/4.30*** — *Sep 2023 - June 2025 (Expected)*
- **The Hong Kong Polytechnic University** — Kowloon, Hong Kong
  Bachelor of Engineering - Electronic and Information Engineering; ***GPA: 4.05/4.30*** — *Aug 2019 - June 2023*
  Minor in Applied Mathematics

Work and Research Experience

- **Interactive Perception and Robot Learning, Stanford University** — Stanford, California
  Research Assistant — *Feb 2024 - Present*
  - Worked with PhD candidate Marion Lepert, under the supervision of Prof. Jeannette Bohg.
  - **Robot Manipulation from Human Videos**: (Work in Progress) Extracted hand poses from human videos and converted to actions; Segmented out human hand using SAM2; Rendered hand mask from hand pose using MANO hand. To be published in early 2025. The next step is to zero-shot transfer a policy trained on videos of humans performing a task with augmented frames to a robot.
  - **Haptic Data Analysis in Large Robotics Dataset**: Explored joint torque data in a large robotics dataset - DROID dataset, converted joint torque data to external force data.
  - **Robot Learning in Simulation**: Evaluated Reinforcement Learning and Imitation Learning methods on robotics-related tasks in Mujoco.
- **Intuitive Surgical** — Sunnyvale, California
  Machine Learning Intern — *June 2024 - Sep 2024*
  - **Deep Learning-based Gaze Estimation**: Designed and implemented an end-to-end deep learning-based 3D gaze estimation algorithm. The algorithm is robust to head motions and subject appearance differences.
  - **Performance Improvement**: The developed algorithm improves the gaze estimation performance by **84.5%**.
  - **Synthetic Data**: Generated more than **100k** synthetic data and images with suitable domain randomization in Blender for gaze estimation training.
  - **Data Collection**: Designed real-world gaze estimation data collection pipeline and conducted data collection. Did detailed analysis and visualization of the dataset.
  - **Semi-auto Labeling**: Implemented a semi-auto labeling tool for pupil localization and segmentation using SAM2.
- **Collaborative Haptics and Robotics in Medicine Lab, Stanford University** — Stanford, California
  Research Assistant — *Sep 2023 - Dec 2023*
  - Worked with Dr. Alaa Eldin Abdelaal, under the supervision of Prof. Allison Okamura.
  - **Force-Aware Autonomous Robotic Surgery**: Assisted in the data collection, model training, and model design in robot imitation learning using force and vision data for robotic automatic surgery. The task completion rate of autonomous tissue retraction increased **50%** with haptic sensing.
  - **dVRK System**: Conducted experiments using the da-Vinci Research Kit.
- **China Telecom AI** — Beijing, China
  Computer Vision Algorithm Intern — *June 2023 - Aug 2023*
  - **ICCV Challenge**: Co-led the team in the **ICCV'23** Open Fine-Grained Activity Detection Challenge.
  - **Video Understanding**: Finetuned large video foundation models such as VideoMAE and UniFormer on a new dataset for Video Understanding in the challenge.
  - **Result**: Got third place on the video activity recognition track and second place on the video activity detection track.

Projects

- **Deep Speaker Embedding Across Languages** — Kowloon, Hong Kong
  Speaker Verification, Domain Adaptation — *Sep 2022 - April 2023*
  - Trained deep speaker embedding with a domain loss to alleviate the language mismatch problem.
  - Improved the performance of ECAPA-TDNN (pre-trained using the English dataset) on the unlabelled Chinese dataset by **10%** with the MMD-based domain loss.
  - Won the Honours Project - Technical Excellence Award.
- **A Monocular Visual Odometry System with 3D Multi-Object Tracking** — Kowloon, Hong Kong
  Visual Odometry, Multi-Object Tracking — *May 2021 - Oct 2021*
  - Developed a Deep learning-based integration of monocular visual odometry and Multi-Object Detection.
  - Used deep optical-flow estimation for localization and 3D object detection models for tracking-by-detection.

Skills

- **Languages**: Python, Java, C++, C, MATLAB, R
- **Frameworks**: PyTorch, TensorFlow, ROS, dVRK, Pandas, Matplotlib, Scikit-learn, Neo4j
- **Tools and Platforms**: Git, Docker, LaTeX, Blender, Mujoco, Linux (Ubuntu), Raspberry Pie, STM32

Selected Honors and Awards

- **Outstanding Student Award of Faculty of Engineering (Ranked No.1)** — June, 2023
  The Hong Kong Polytechnic University
- **Scholarship on Outstanding Performance (80,000 HKD)** — Dec, 2021
  The HKSAR Government