
Irving Fang

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Education

New York University <i>PhD in Computer Science and Engineering</i>	Fall 2023 - Present <i>Major GPA: 4.00</i>
New York University <i>Master in Computer Engineering</i>	Fall 2021 - Spring 2023 <i>Major GPA: 4.00</i>
University of California, Berkeley <i>Majors: Pure Mathematics and Data Science(with emphasis on Robotics)</i> <i>Minors: Computer Science and Japanese Literature</i>	Fall 2016 - Fall 2020 <i>DS Major GPA: 3.56</i>

Research Experiences

I am interested in **multi-modal robotic perception (tactile, visual, biosignal, etc.)**, and perception algorithm that makes robots more viable in real life with **better power efficiency, execution speed**, and so on.

I use tools like **deep learning, neuromorphic computing, model predictive control** and etc..

AI4CE Lab at NYU Graduate Researcher advised by Prof. Chen Feng	New York, NY <i>Sep 2021 - Present</i>
<ul style="list-style-type: none">• Please refer to my publication section for my research activity focusing on robotics, deep learning, etc.• Deployed large-scale training and testing on HPC.	

Mitsubishi Electric Research Laboratories (MERL) Research Intern advised by Dr. Radu Corcodel	Cambridge, MA <i>May 2022 - Aug 2022</i>
<ul style="list-style-type: none">• Worked on using proprietary tactile sensors and deep reinforcement learning to facilitate dexterous robotic manipulation. More details in the future due to NDA.	

BEST Lab at UC Berkeley & Squishy Robotics Undergraduate Researcher advised by Prof. Alice Agogino	Berkeley, CA <i>Aug 2020 - May 2022</i>
<ul style="list-style-type: none">• Built and trained LSTM models on fault detection and prediction• Combined the idea of Expected Value of Information with ML to explore adaptive sensor placement using tensegrity-structure robots . (Paper accepted by IMECE 2021)	

LAPACK Development at UC Berkeley Undergraduate Researcher advised by Prof. James Demmel and N. Benjamin Erichson.	Berkeley, CA <i>Sep 2020 - Dec 2020</i>
<ul style="list-style-type: none">• Implemented Randomized Kaczmarz method using Python• Benchmarked Randomized Kaczmarz method with other least square solvers such as Blendenpik method and LSRN method as part of the development work for the next generation LAPACK and ScaLAPACK that focus on randomized linear algebra algorithm.	

Multimedia Group at UC Berkeley Undergraduate Researcher advised by Prof. Gerald Friedland	Berkeley, CA <i>Aug 2020 - Dec 2020</i>
<ul style="list-style-type: none">• Implemented multi-modal ensemble models to predict videos' short-term and long-term memorability. (Best Model for MediaEval 2020 on this track)	

California Institute of Technology

Research Intern advised by Prof. Matthew Shum

Remote

May 2020 - Aug 2020

- Used **fine-grained classification** model on streetview images collected via Baidu API to conduct gender detection on pedestrians and explored its relationship with economic inequality and gender mobility

Berkeley Social Interaction Lab

Undergraduate Researcher advised by Dr. Yang Bai

Berkeley, CA

March 2018 - October 2018

- Used Gensim and NLTK to implement **LDA (latent Dirichlet allocation)** model and **TF-IDF** model to analyze survey data and Tweets collected via Twitter API as a part of the Cal Project Awe.

Publications

2023

I. Fang*, Y. Chen*, Y. Wang*, J. Zhang, Q. Zhang, J. Xu, X. He, W. Gao, H. Su, Y. Li, and C. Feng, "Egopat3dv2: Predicting 3d action target from 2d egocentric vision for human-robot interaction," *ICRA 2024 (Under Review)*, 2024, (* for equal contribution).

Y. He*, **I. Fang***, Y. Li, and C. Feng, "Metric-free exploration for topological mapping by task and motion imitation in feature space," *RSS 2023*, 2023, (* for equal contribution).

2021

A. Agogino, H. Y. Jang, V. Rao, R. Batra, F. Liao, R. Sood, **I. Fang**, R. L. Hu, E. Shoichet-Bartus, and J. Matranga, "Dynamic placement of rapidly deployable mobile sensor robots using machine learning and expected value of information," *ASME International Mechanical Engineering Congress and Exposition*, 2021. DOI: 10.1115/IMECE2021-70759, (Authors ordered by department affiliation, not contribution).

2020

T. Zhao, **I. Fang**, J. Kim, and G. Friedland, "Multi-modal ensemble models for predicting video memorability," *MediaEval2020*, 2020.

Projects

Please refer to this Github repo for all my public projects: https://github.com/IrvingF7/my_project_list, which contains pointers to several projects involving deep learning, robotics, control, traditional computer vision, RSIC-V, and some other fields that I dabbled in.

Awards

The Myron M. Rosenthal Award for Best MS Academic Achievement in Electrical and Computer Engineering, 2023

- Given to MS students in electrical or computer engineering who have achieved excellent academic performance.

Teaching Experiences

ROB-GY 6203 Robot Perception

Teaching Aide

New York, CA

Fall 2022, 2023

ROB-UY 3203 Robot Vision

Teaching Aide

New York, CA

Spring 2022, 2023

CS 61B: Data Structures and Algorithms

Lab Assistant

Berkeley, CA

Summer 2017

Work Experiences

Wahve & CITRIS Institute

Software Engineering Intern

Berkeley, CA

February 2019 - August 2019

- Set up and maintained Jupyterhub on Google Cloud Platform for the team
- Used decision tree and NLP techniques to predict outcome/yield rate of applicants with successful rate over 95%, and explored what factors are affecting the outcome and yield rate

Snipfeed

Berkeley, CA

Software Engineering Intern

September 2018 - December 2018

- Used Gensim's doc2vec to optimize the search engine of the APP to better query article from the internal database.

Skills and Qualifications

Programming Languages – Python, MATLAB, C/C++, Rust, Verilog/VHDL, T_EX

Frameworks/Libraries – PyTorch, ROS, HPC Toolkit(Singularity, SLURM, etc.), Habitat, TensorFlow/Keras

Languages – English (Bilingual), Chinese (Bilingual), Japanese (Limited Working)

Selected Coursework

Undergraduate:

- | | |
|---|----|
| • EECS 106A/206A Introduction to Robotics | B+ |
| • EECS 106B/206B Robotic Manipulation and Interaction | A+ |
| • CS 188 Introduction to Artificial Intelligence | A- |
| • CS 189 Introduction to Machine Learning | B- |
| • CS 162 Operating Systems and System Programming | A- |
| • EE 128 Feedback Control System | B |
| • STAT 134 Concepts of Probability | B |
| • DATA 100 Principles & Techniques of Data Science | A |
| • MATH 185 Introduction to Complex Analysis | A |
| • MATH 221 Advanced Matrix Computations | A- |

Graduate:

- | | |
|--|-------------------|
| • CSCI-GY 3033 Learning with Large Language and Vision Models | <i>InProgress</i> |
| • CS-GY 6033 Design and Analysis of Algorithms I | <i>InProgress</i> |
| • CS-GY 9223 Virtual and Augmented Reality | <i>InProgress</i> |
| • ECE-GY 7123 Deep Learning | A |
| • ECE-GY 9133 Foundations of Deep Learning | A |
| • ECE-GY 9143 Introduction to High Performance Machine Learning | A |
| • ROB-GY 6203 Robot Perception | A |
| • ROB-GY 6213 Robot Localization and Navigation | A |
| • ROB-GY 6323 Reinforcement Learning and Optimal Control for Robotics | A |
| • ROB-GY 6333 Networked Robotics Systems, Cooperative Control and Swarming | A |
| • ROB-GY 6423 Interactive Medical Robotics | A |
| • ECE-GY 6463 Advanced Hardware Design (FPGA) | A |
| • ECE-GY 6483 Real-Time Embedded Systems | A |