Howard Zhang

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EDUCATION

University of California, Berkeley

Bachelor of Science, Electrical Engineering and Computer Sciences, **GPA: 3.9**, **High Honors**, **Dean's List**, August 2017 - May 2020

Master of Science, Electrical Engineering and Computer Sciences, **GPA: 3.9**, **Dean's List**, August 2020 - May 2021

University of California, Los Angeles

PhD, Electrical and Computer Engineering, **GPA: 4.0**, **AI Rising Scholar Fellowship**, September 2021 - June 2025 Research in **Computer Vision** and **Computational Imaging** with the Visual Machines Group and Professor Achuta Kadambi

PUBLICATIONS

● *Enhancing Diffusion Models with 3D Perspective Geometry Constraints (**SIGGRAPH Asia** 2023)*

● *WeatherStream: Light Transport Automation of Single Image Deweathering (**CVPR** 2023, first author)*

● *Depth Estimation From Camera Image and mmWave Radar Point Cloud (**CVPR** 2023)*

● *Not Just Streaks: Towards Ground Truth for Deraining (**ECCV** 2022, first author)*

● *Learning Accurate Long-term Dynamics for Model-based Reinforcement Learning (IEEE CDC 2021, NeurIPS 2020 Workshop)*

● *Analyzing the Prediction Accuracy of Trajectory-Based Models with High-Dimensional Control Policies for Long-term Planning in MBRL (Master's Thesis)*

RESEARCH/PROJECTS

Snap Internship (June 2022 - September 2022, June 2023 - September 2023)

● Developed a new **facial and image enhancement algorithm** with the Camera research team

● Used data balancing techniques to **enhance skin-color fairness** for CV generative models

● Experience with **Diffusion-based** generative models, **GANs** for denoising/deblurring tasks

● Experience with deep learning **Knowledge Distillation** algorithms

Computer Vision in Adverse Conditions (UCLA, May 2021 - Present)

● Working on improving computer vision model accuracy in adverse conditions (low-light, weather, etc.)

● **Contrastive Learning**, **Cycle-GAN**, **Res-Net**, **U-Net, Transformer**, etc. architectures in **PyTorch** and **TensorFlow**

● Experience with **Synthetic Generation** models, **Stable Diffusion**, **GANs,** etc.

● Experience in neural rendering: **NeRFs**, **3DGS**, etc.

● Experience with **Classical CV: Stereo Matching, SfM, Image Processing**, etc.

OPPO Machine Learning Research Internship (May 2021 - August 2021)

● Created new lighting estimation machine learning algorithm to predict spherical harmonic lighting parameters from images

● Gained experience with developing **PyTorch**, **ONNX**, and **SNPE** machine learning models

● Gained experience with training and optimizing **high-frequency models** for Android deployment

Model-Based RL with Trajectory-based Models (UC Berkeley, August 2019 - May 2021)

● Worked on improving dynamics estimation neural network model accuracy in MBRL using a new problem formulation

● Experience using **Model Predictive Control**, **Bayesian Optimization** and other control algorithms

● Experience with various forms of **Reinforcement Learning** algorithms in **PyTorch**

● Experience with **Mujoco** simulations

Qualcomm Internship (May 2020 - August 2020)

● Worked on Adreno630 Matrix Multiplication and Convolutions

● Experience with **OpenCL** and **GPGPU Computing**, GPU Architectures and Graphics Programming

Uncalibrated Photometric Stereo on Non-Lambertian Scenes (UC Berkeley, August 2019 - May 2020)

● Worked on improving neural network-based **Photometric Stereo** algorithms

● Experience with Neural Network design using **Chainer**

Robotics Soft Tactile Sensing (UC Berkeley, August 2019 - May 2020)

- Worked with a soft tactile sensor to perform facial recognition using incoming point cloud data
- Experience working with **ROS** libraries and Robotics Control
- Experience working with **C++** Point Cloud Libraries
- Experience working with **PyTorch** Machine Learning Algorithms

SERVICE

The 6th Workshop and Prize Challenge Bridging the Gap between Computational Photography and Visual Recognition (CVPR 2023, CVPR 2024)

- Hosting CVPR Workshop Challenge for Semantic Segmentation in Adverse conditions (2024)
- Hosted CVPR Workshop Challenge for Single Image Deraining with over 200 participants from top institutions (Stanford, Purdue, Peking, Tsinghua, Yale, etc.)

AAAI 2024 Program Committee Member
ECCV 2022 Emergency Reviewer

INVITED TALKS

UCLA Vision Seminar (2023)

Caltech Computational Cameras Lab (2022)

Snap Creative Vision (2022)

TEACHING

UCLA ECE 188 Introduction to Computer Vision TA (Spring 2023)

UC Berkeley CS61B TA (Fall 2019)

SKILLS

Programming: Python, Java, C++, C, Matlab, HTML, CSS, Javascript, SQL
Libraries: PyTorch, TensorFlow, Chainer, ROS