Yunhan Zhao

4209 Donald Bren Hall, Irvine, CA

+1-607-240-6250

yunhaz5@ics.uci.edu; yunhanz@google.com

https://www.ics.uci.edu/~yunhaz5/

RESEARCH INTERESTS	Computer vision, Machine learning, 3D scene perception, Generative models, Foundation Models (LLM/VLM), Egocentric vision, Domain adaptation

Software Engineer, Google   Jul. 2024 - present
- Research, developing and prototyping on-device machine learning and computational photography features for Pixel cameras.

ACADEMIC BACKGROUND

University of California, Irvine
Ph.D. in Computer Science   Jun. 2024
- Advisor: Charless Fowlkes

Johns Hopkins University
M.S. in Applied Mathematics and Statistics   May. 2019
- Optimization and Operation Research Track

M.S. in Robotics   May. 2018
- Advisor: Alan Yuille
- Perception and Cognitive Track

Binghamton University, State University of New York
B.S. in Mechanical Engineering   May. 2016
- Cumulative GPA: 3.90/4.0; Summa Cum Laude
- Transferred from Southeast University, Nanjing, China

RESEARCH EXPERIENCE

Google AR   Mountain View, CA
SWE Internship, Advisor: Neil Goeckner-Wald   Jun. 2023 - Sep. 2023
- Proposed and implemented a transformer-based image enhancement pipeline specifically for improving text clarity on the AR/VR device.
- Designed a new quantitative metric that measures the text clarity of enhanced images by leveraging the optical character recognition (OCR) scores.

Adobe Research   Remote
Research Internship, Advisor: Connelly Barnes   Jun. 2022 - Sep. 2022
- Advanced 3D-aware generative models that allow video synthesis from one single image with user-defined camera trajectories.
- Implemented an efficient ray-sampling approach that allows fast and stable learning with differentiable neural renders.

Research Internship, Advisor: Connelly Barnes   Jun. 2021 - Dec. 2021
- Improved the reference-based image inpainting model under complex scene geometry.
- Proposed GeoFill, a novel optimization-based 3D-aware warping module that achieves state-of-the-art performance.

Carnegie Mellon University, The Robotics Institute Remote
Research Assistant, Advisor: Deva Ramanan and Shu Kong Jun 2020 - Sep 2020

- Explored the problem of LiDAR densification in autonomous driving for better downstream tasks, such as 3D object detection.
- Successfully densified LiDAR sweeps by adopting monocular depth completion with camera egomotion compensation.

Johns Hopkins University, CCVL Baltimore, MD
Research Assistant, Advisor: Alan Yuille Feb. 2018 - May. 2019

- Improved the object classification accuracy by complementing training sets with self-generated "hard" examples.
- Proposed ITNs that achieved state-of-the-art classification performances on several benchmark datasets.

Massachusetts Institute of Technology, CoCoSci Cambridge, MA
Research Assistant, Advisor: Joshua Tenenbaum Jun. 2018 - Sep. 2018

- Studied the problem of meta few-shot learning with minimal supervision while capable of generating samples from highly structural latent space.
- Achieved close to state-of-the-art classification performance on the Omniglot and Mini-ImageNet datasets.

Johns Hopkins University, CIS Baltimore, MD
Research Assistant, Advisor: Rene Vidal May. 2017 - Dec. 2017

- Proposed a novel deep neural network: Deep MagNet that specifically solves cross-modality domain adaptation problems.
- Outperformed state-of-the-art approaches via extensive experiments, including transferring between Office-Caltech, Sketch-250, Caltech-250 and CAD rendered images.

PUBLICATIONS

8. **Yunhan Zhao**, Qianqian Shen, Nahyun Kwon, Jeeeun Kim, Yanan Li, and Shu Kong. Instance Detection via Foundation Model Adaptation. In submission, 2024

7. Aodong Li, **Yunhan Zhao**, Chen Qiu, Marius Kloft, Padhraic Smyth, Maja Rudolph, Stephan Mandt. Zero-Shot Batch-Level Tabular Anomaly Detection Using LLMs. In *International Joint Conference on Artificial Intelligence, Anomaly Detection with Foundation Models Workshop*, 2024

6. **Yunhan Zhao**, Haoyu Ma, Shu Kong, Charless Fowlkes. Instance Tracking in 3D Scenes from Egocentric Videos. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2024

5. Qianqian Shen*, **Yunhan Zhao***, Nahyun Kwon, Jeeeun Kim, Yanan Li, and Shu Kong. A high-resolution dataset for instance detection with multi-view instance capture. In *Thirty-seventh Conference on Neural Information Processing Systems, Datasets and Benchmarks Track*, 2023

4. **Yunhan Zhao**, Connelly Barnes, Yuqian Zhou, Eli Shechtman, Sohrab Amirghodsi, and Charless Fowlkes. Geofill: Reference-based image inpainting with better geometric understanding. In *The IEEE Winter Conference on Applications of Computer Vision*, 2023

3. **Yunhan Zhao**, Shu Kong, and Charless Fowlkes. Camera pose matters: Improving depth prediction by mitigating pose distribution bias. In *Proceedings*

of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, pages 15759–15768, 2021

2. **Yunhan Zhao**, Shu Kong, Daeyun Shin, and Charless Fowlkes. Domain decluttering: Simplifying images to mitigate synthetic-real domain shift and improve depth estimation. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition,* pages 3330–3340, 2020

1. **Yunhan Zhao**, Ye Tian, Charless Fowlkes, Wei Shen, and Alan Yuille. Resisting large data variations via introspective transformation network. In *The IEEE Winter Conference on Applications of Computer Vision,* pages 3080–3089, 2020

TEACHING EXPERIENCE

- **Teaching Assistant**, University of California, Irvine   Spring 2020
  CS 216: Image Understanding
- **Teaching Assistant**, University of California, Irvine   Winter 2020
  CS 116: Computational Photography and Vision
- **Teaching Assistant**, University of California, Irvine   Fall 2019
  CS 178: Machine Learning and Data Mining

INVITED TALKS

1. Imperial College London Reading Group: Camera Pose Matters: Improving Depth Prediction by Mitigating Pose Distribution Bias; Irvine, CA (Remote); Jun. 2021

PROFESSIONAL ACTIVITY

Conference Reviewer:
- CVPR, ICCV, ECCV, WACV

Journal Reviewer:
- Neurocomputing, TPAMI