

# Hao Liang

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## Research Focus

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Generative models in computer vision, with applications to 2D/3D human and medical image analysis. Additional interests include model robustness, explainability, and distributed learning frameworks such as federated learning.

## Education

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Rice University, Ph.D. in Electrical and Computer Engineering	2021 – 2026
Carnegie Mellon University, M.S. in Electrical and Computer Engineering	2018 – 2020
University of Electronic Science and Technology of China, B.E. in Electrical Engineering	2014 – 2018

## Experience

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<b>Research Assistant</b> , Rice University, Supervisor: Prof. Guha Balakrishnan	2021 – Present
<ul style="list-style-type: none"><li>Virtual Selfie Stick: Developing an innovative view synthesis (NVS) algorithm using 3D Gaussian Splatting that generates “virtual selfies” of a group of people, allowing precise control over camera angle and distance. (Samsung-MPI)</li><li>Causal Benchmarking: Developed a synthetic dataset of human faces with attributes changing using GANs and Human annotations as labels, used it to analyze existing Face Recognition Algorithms to identify a causal relationship between attributes and the bias of models.</li><li>Bias and Kernel Size: Proposed a framework to understand to linking between the model bias and the model architectural design choice.</li></ul>	
<b>Research Associate</b> , Carnegie Mellon University, Supervisor: Prof. Giulia Fanti	2020 - 2021
<ul style="list-style-type: none"><li>RareGAN: Designed an algorithm to efficiently generate samples from rare classes in GANs.</li></ul>	
<b>Research Assistant</b> , Carnegie Mellon University, Supervisor: Prof. Gauri Joshi	2018 - 2020
<ul style="list-style-type: none"><li>FedNOVA: Designed algorithms on computational and communicational efficient Federated Learning (FL), solved the problem of heterogeneous goals in FL.</li></ul>	

## Selected Publications

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**Benchmarking Algorithmic Bias in Face Recognition: An Experimental Approach Using Synthetic Faces and Human Evaluation**

*Hao Liang*, Pietro Perona Guha Balakrishnan, ICCV 2023

**Linking convolutional kernel size to generalization bias in face analysis CNNs**

*Hao Liang*, Josue Ortega Caro Vikram Maheshri, Ankit B Patel, Guha Balakrishnan, WACV 2024

**Visualizing chest X-ray dataset biases using GANs**

*Hao Liang*, Kevin Ni Guha Balakrishnan, MIDL 2023

**Tackling the objective inconsistency problem in heterogeneous federated optimization**

Jianyu Wang, Qinghua Liu, *Hao Liang*, Gauri Joshi Vincent Poor, NeurIPS 2020

**Overlap local-SGD: An algorithmic approach to hide communication delays in distributed SGD**

Jianyu Wang , *Hao Liang*, Gauri Joshi, ICASSP 2020

## Services

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**Reviewer:** NeurIPS, ICCV, ECCV, CVPR, ICML, ICLR, ICASSP, AISTATS, AAAI, IEEE Transactions on Signal Processing

**Workshop co-organizer:** First Workshop on Experimental Model Auditing via Controllable Synthesis (EMACS) at CVPR 2025