

Yi Hua

A painter who builds novel cameras.



yihua25@gmail.com

hawaii.github.io

RESEARCH • Computational Photography • Lensless Imaging • 3D Reconstruction
INTERESTS • Depth Imaging • Camera Calibration • Creative Tools

EDUCATION **Carnegie Mellon University**
Ph.D., Electrical & Computer Engineering, Jan. 2023.
M.S., Computer Vision, Dec. 2016.

Rice University
B.S., Computer Science; minor in Mathematics, May 2015.

AWARDS **Carnegie Institute of Technology Dean's Fellow**, 2017
People's Choice Award at HackRice, 2015

EXPERIENCES **World Labs**, 2024-present
Member of Technical Staff

Epic Games, 2023-2024
Research Scientist

- High resolution NeRF reconstruction from camera captures
- Neural lens modeling for spherical and anamorphic lenses

Carnegie Mellon University, Image Science Lab, 2017-present
Ph.D. student, advisor: Prof. Aswin C. Sankaranarayanan

- Physics-based differential rendering for 3D lensless imaging
- Programmable lensless imagers for better 3D imaging quality
- Deformable lensless imager with on the sphere and curved surfaces

Google Daydream, summer 2018
Software engineering intern

- Trained cross-spectral (RGB - infrared) matching network for trinocular stereo
- Improves high-resolution depth estimation of specular objects for Project Starline

Meta Reality Labs Research (formerly Oculus Research), 2016
Capstone project

- Built a robotic calibration system for camera to IMU calibration
- Improves headset pose estimate frame rate from camera-only system

Apple Special Project Group, summer 2016
Software engineering intern

Rice University Computer Vision Lab, 2014

Student researcher

- Built a multi-camera system for accurate indoors human detection

Heidelberg Collaboratory for Image Processing (Germany), summer 2013

DAAD RISE research intern

- Created tools for 2D to 3D film conversion by classifying depth edges with random forest

PUBLICATIONS Yi Hua, M. Salman Asif and Aswin C. Sankaranarayanan, *Spatial and Axial Resolution Limits for Mask-based Lensless Cameras*, Optics Express, 2022.

Hossein Baktash, Yash Belhe, Matteo Giuseppe Scopelliti, Yi Hua, Aswin C. Sankaranarayanan, Maysamreza Chamanzar, *Computational Imaging using Ultrasonically-Sculpted Virtual Lenses*, Intl. Conf. Computational Photography (ICCP), 2022.

Yucheng Zheng, Yi Hua, Aswin C. Sankaranarayanan and M. Salman Asif, *A Simple Framework for 3D Lensless Imaging with Programmable Masks*, in ICCV, 2021.

Yi Hua, Shigeki Nakamura, M. Salman Asif and Aswin C. Sankaranarayanan, *SweepCam — Depth-aware Lensless Imaging using Programmable Masks*, in Trans. Pattern Analysis and Machine Intelligence (TPAMI) / ICCP 2020.

COURSES

Carnegie Mellon University

Computer Vision (A), Geometry-based Methods in Vision (A), Physics-based Methods in Vision (A-), Visual Learning & Recognition (A), Adv. Computer Vision Apps (A), Applied Stochastic Processes (A), Estimation Detection & Identification (A), Convex Optimization (A), Linear Systems(A), Discrete Differential Geometry (A)

Rice University

Honors Linear Algebra (A), Statistical Machine Learning (A-), Modern Physics (A), Adv. Computer Graphics (A), Life Drawing (A), Sculpture (A), Intro. Film-making & Editing (A)

TEACHING
ASSISTANT

Electrical & Computer Engineering, Carnegie Mellon University

Mathematical Foundations of Electrical Engineering, 2019; Signal and Systems, 2018; Image and Video Processing, 2018

Computer Science, Rice University

Parallel Computing, 2015; Intro. to Program Design, 2014; Algorithmic Thinking, 2014

ACADEMIC
SERVICE

Review for journals and conferences

IEEE Transactions on Computational Imaging; Optics Express
CVPR 2022, 2023; ECCV 2022, ICCV 2023

SKILLS

Programming

Python, C++, MATLAB, Java; PyTorch, Tensorflow, OpenCV, ROS

Fabrication

SolidWorks, laser cutting, 3D printing, crochet

Artistic

Watercolor painting, animated illustration (hawaiiwatercolor.tumblr.com)