

Yi Hua

A painter who builds novel cameras.



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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, Nov. 2022 (expected).
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 **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	<p>Yi Hua, M. Salman Asif and Aswin C. Sankaranarayanan, <i>Lensfree Z-Stacking: A Theory of Volumetric Convolution for Lensless Cameras</i>, under review at SIGGRAPH ASIA, 2022</p> <p>Hossein Baktash, Yash Belhe, Yi Hua, Matteo Giuseppe Scopelliti, Aswin C. Sankaranarayanan, Maysam Chamanzar, <i>Computational Imaging using Ultrasonically-Sculpted Virtual Lenses</i>, under review at Intl. Conf. Computational Photography (ICCP), 2022.</p> <p>Yucheng Zheng, Yi Hua, Aswin C. Sankaranarayanan and M. Salman Asif, <i>A Simple Framework for 3D Lensless Imaging with Programmable Masks</i>, in ICCV, 2021.</p> <p>Yi Hua, Shigeki Nakamura, M. Salman Asif and Aswin C. Sankaranarayanan, <i>SweepCam — Depth-aware Lensless Imaging using Programmable Masks</i>, in Trans. Pattern Analysis and Machine Intelligence (TPAMI) / ICCP 2020.</p>
COURSES	<p>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)</p> <p>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)</p>
TEACHING ASSISTANT	<p>Electrical & Computer Engineering, Carnegie Mellon University Mathematical Foundations of Electrical Engineering, 2019; Signal and Systems, 2018; Image and Video Processing, 2018</p> <p>Computer Science, Rice University Parallel Computing, 2015; Intro. to Program Design, 2014; Algorithmic Thinking, 2014</p>
ACADEMIC SERVICE	<p>Review for journals and conferences IEEE Transactions on Computational Imaging, Optics Express, CVPR 2022, ECCV 2022</p>
PROJECTS	<p>Peel: Style Transfer App on Android , 2015 An app that let you "peel" a color filter from a photo you like and apply it to your photo</p> <p>We put food on your plate: Augmented Reality App on Android , 2014 An app that augments empty plates detected from camera with food</p>
SKILLS	<p>Programming Python, C++, MATLAB, Java; PyTorch, Tensorflow, OpenCV, ROS</p> <p>Fabrication SolidWorks, laser cutting, 3D printing, crochet</p> <p>Artistic Watercolor painting, animated illustration (hawaiiwatercolor.tumblr.com)</p>