

# Yongyi Zhao

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## Education

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### Rice University

**Master of Science in Electrical and Computer Engineering**  
**Doctor of Philosophy in Electrical and Computer Engineering**  
**Adviser:** Professor Ashok Veeraraghavan

**Aug 2018 – Mar 2021**  
**Mar 2021 – Present**  
**Houston, TX**

### Carnegie Mellon University

**Bachelor of Science in Electrical and Computer Engineering**  
With University Honors; **GPA: 3.93/4.00**

**Aug 2014 – Dec 2017**  
**Pittsburgh, PA**

## Research Experience

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### Rice University: Computational Imaging Lab

**Aug 2018 – Present**  
**Houston, TX**

- ❖ **Adviser:** Prof. Ashok Veeraraghavan
- ❖ Developing techniques for minimally-invasive imaging of neural activity
- ❖ Developing algorithm to accelerate simulations of photon propagation through biological tissue

### Carnegie Mellon University: Image Science Lab

**Jan 2017 – May 2018**  
**Pittsburgh, PA**

- ❖ **Adviser:** Prof. Aswin Sankaranarayanan
- ❖ Researched, developed, and analyzed accuracy of computational camera models
- ❖ Developed prototype of spherical, lensless imaging device

## Selected Publications

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**Zhao Y.**<sup>\*</sup>, Raghuram A.<sup>\*</sup>, et al. “High Resolution, Deep Imaging Using Confocal Time-of-flight Diffuse Optical Tomography.” *IEEE Transactions on Pattern Analysis and Machine Intelligence*. (2021)

**Notable Paper: ICCP Conference Best-Paper Runner-Up**

Kim H. K., **Zhao Y.**, et al. Ultrafast and Ultrahigh-Resolution Diffuse Optical Tomography for Brain Imaging with Sensitivity Equation based Noniterative Sparse Optical Reconstruction (SENSOR). *JQSRT*. (2021).

Dave A., **Zhao Y.**, Veeraraghavan A. "PANDORA: Polarization-Aided Neural Decomposition Of Radiance." European Conference on Computer Vision (ECCV). (2022).

Raghuram A., **Zhao Y.**, et al. “Measuring Physiological Parameters Under the Skin Using Visible/NIR Light.” *Encyclopedia of Sensors and Biosensors* 4, pp. 133-142. **[Book Chapter]**

**Zhao Y.**, Raghuram A., et al. “Unrolled-DOT: An Interpretable Deep Network for Diffuse Optical Tomography.” *Journal of Biomedical Optics*. (2023)

<sup>\*</sup>Indicates authors contributed equally

## Awards & Honors

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**National Library of Medicine Fellowship in Bioinformatics and Data Science**  
❖ 2-year fellowship; \$25,320 stipend and partial tuition support

**Jan 2021 – Dec 2022**

### John Clark Jr. Fellowship Award

**Aug 2018**

- ❖ Fellowship from Rice University, supporting first-year graduate studies

### Frank J. Marshall Scholar Award

**May 2018**

- ❖ Annual award for one graduating CMU ECE undergraduate for academics and research

**Andrew Carnegie Society (ACS) Scholar**

**Sep 2017**

- ❖ Recognized as one of 40 students for academics, involvement and leadership

**Eta Kappa Nu, IEEE Honor Society**

**Nov 2017**

**Tau Beta Pi Engineering Honor Society**

**Nov 2016**

**CMU Summer Undergraduate Research Fellowship**

**May 2015**

## Projects

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**Monte Carlo Renderer**

**Aug 2019 – Present**

- ❖ Simulates light propagation and Jacobian matrix for arbitrary scattering media, parallelized in Cuda C++
- ❖ [https://github.com/yyiz/maui\\_code](https://github.com/yyiz/maui_code)

**Autonomous Electric Vehicle** (Capstone Project, 3-Person Group)

**Aug 2017 - Dec 2017**

- ❖ Implemented robot that could navigate obstacle course of boxes using purely image processing
- ❖ Programmed RasPi interface to collect camera data and perform movements on encoded DC motors

**Cartoon Interpolation Animator**

**Dec 2016**

- ❖ Animate 2-D image using interpolation: manipulate using cage, skeleton, spline interpolation
- ❖ Implemented program in Python, using python image library for speed optimization and user interface

**Racing Simulation using OpenCV Motion Detection**

**April 2015**

- ❖ Presented as one of top 15 projects (of ~400 students) for 15-112 Spring 2015 Course
- ❖ Used OpenCV library to create racing game that could read hand and feet motion of user as controls

## Work Experience

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**Teaching Assistant (TA), 15-112 at Carnegie Mellon University**

**Aug 2016 – Dec 2016**

- ❖ Lead recitation of 20 students, weekly lecture to deepen students' understanding
- ❖ Perform course logistics: grading, tutoring at office hours, leading review sessions

**Jan 2018 – May 2018  
Pittsburgh, PA**

**Teaching Assistant (TA), 18-240 at Carnegie Mellon University**

**Aug 2017 – Dec 2017**

- ❖ Lead lab section of 30 students, weekly project to deepen students' understanding
- ❖ Perform course-support tasks: grading, tutoring at office hours, leading review sessions

**Pittsburgh, PA**

**Software Development Engineer Intern at Amazon.com**

**May 2017 – Aug 2017**

- ❖ Working on Amazon AWS, Elastic Compute Cloud Team
- ❖ Designing and implementing container service

**Seattle, WA**

## Skills

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**Programming/Computing:**

- ❖ **Strong:** Python (including PyTorch library), Matlab
- ❖ **Proficient:** C/C++, Matlab, Linux
- ❖ **Limited:** Version Control (Git), Cuda, Qt, SystemVerilog

## Volunteer Activities

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**Mentor, PATHS-UP Research Experience for Teachers (RET)**

**May 2019 – July 2019**

- ❖ Mentored 6 teachers who taught in underrepresented communities of Houston Independent School District
- ❖ Designed a curriculum to teach RETs the remote photoplethysmography algorithm

**Mentor, Higher Achievement**

**Oct 2014 – May 2017**

- ❖ Tutored group of 2-5 middle school students in project design and scientific method
- ❖ Created and implemented projects to teach programming and experimental design

