Yongyi Zhao

yongyi 'at' rice 'dot' edu | yongyizhao.com

Education

Rice University
Master of Science in Electrical and Computer Engineering — **Aug 2018 – Mar 2021**
Doctor of Philosophy in Electrical and Computer Engineering — **Mar 2021 – Present**
Adviser: Professor Ashok Veeraraghavan — **Houston, TX**

Carnegie Mellon University — **Aug 2014 – Dec 2017**
Bachelor of Science in Electrical and Computer Engineering — **Pittsburgh, PA**
With University Honors; **GPA: 3.93/4.00**

Research Experience

Rice University: Computational Imaging Lab — **Aug 2018 – Present**
- **Adviser:** Prof. Ashok Veeraraghavan — **Houston, TX**
- 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**
- **Adviser:** Prof. Aswin Sankaranarayanan — **Pittsburgh, PA**
- Researched, developed, and analyzed accuracy of computational camera models
- Developed prototype of spherical, lensless imaging device

Selected Publications

Zhao Y.[*], Raghuram A.[*], 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)

[*]Indicates authors contributed equally

Awards & Honors

National Library of Medicine Fellowship in Bioinformatics and Data Science — **Jan 2021 – Dec 2022**
- 2-year fellowship; $25,320 stipend and partial tuition support

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

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

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

Teaching Assistant (TA), 15-112 at Carnegie Mellon University **Aug 2016 – Dec 2016**
- Lead recitation of 20 students, weekly lecture to deepen students' understanding **Jan 2018 – May 2018**
- Perform course logistics: grading, tutoring at office hours, leading review sessions **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 **Pittsburgh, PA**
- Perform course-support tasks: grading, tutoring at office hours, leading review sessions

Software Development Engineer Intern at Amazon.com **May 2017 – Aug 2017**
- Working on Amazon AWS, Elastic Compute Cloud Team **Seattle, WA**
- Designing and implementing container service

Skills

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

Volunteer Activities

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