

# Longqian Huang

(+86)18888910891 | longqianh@zju.edu.cn | peter-opt.com

## EDUCATION

**Chu Kochen Honors College, Zhejiang University**  
*Bachelor of Opto-electronic Information Science and Engineering*

China

Sept. 2018 – June 2022

- GPA: 3.94/4.00

## RESEARCH INTERESTS

- Fiber-based Optogenetics
- Learning-based Adaptive Optics
- Digital Optical Phase Conjugation
- Computational Holography
- Spectral Imaging
- Optical Coherence Tomography Oximetry

## PUBLICATIONS

1. **Huang, L.**, Luo, R., Liu, X., & Hao, X. (2022). Spectral imaging with deep learning. *Light: Science & Applications*, 11(1), 1-19. (**Cover**)
2. Zhang, W., Song, H., He, X., **Huang, L.**, Zhang, X., Zheng, J., ... & Liu, X. (2021). Deeply learned broadband encoding stochastic hyperspectral imaging. *Light: Science & Applications*, 10(1), 1-7.

## PATENTS

1. A holographic three-dimensional display device based on spatial light modulator. Third inventor.
2. A non-destructive sugar content detection device for continuous use of smart phones based on diffuse reflection method. Second inventor.

## RESEARCH EXPERIENCE

**Physics Experimental Center, Zhejiang University**

Sept 2019 – Dec 2020

- Advisor: Xing Chen
- Researched in dynamic 3D holographic display. I took about half a year conducting basic experiments of laser holography, using a holographic dry plate, self-prepared developer and fixer for object recording and display. Then, I turned to 3D computational holography. I used MATLAB to compute sliced phases that are displayed on a spatial light modulator. Finally, I achieved a dynamic 3D holographic display with good quality.

**State Key Lab of Modern Optical Instrumentation, Zhejiang University**

January 2020 – August 2021

- Mentor: Prof. Xu Liu & Prof. Xiang Hao
- We explored an optical filter-based approach towards fast and accurate spectral imaging. Using deep learning to design optical filters for spectrum encoding and spectral reconstruction, we achieved 7000–11,000 times faster signal processing and ~ 10 times improvement regarding noise tolerance. I participated in most of the experimental works, and the article was received by *Light: Science & Applications*.

In the meantime, I conducted a survey about deep learning-empowered spectral imaging, categorizing them into amplitude-coded, phase-coded, and wavelength-coded, based on the fundamental properties of light. The survey was written as a review article and was also received by *Light: Science & Applications*. This review was chosen as the editor's pick (issue cover) and awarded the top downloaded papers in 2022.

**International research center for advanced photonics, Zhejiang University**

June 2021 – March 2023

- Mentor: Asso. Prof. Peng Li

- We leveraged optical coherence tomography (OCT) and optical coherence tomography angiography (OCTA) to research the vascular properties of the mouse retina. The research is aimed at developing a near-infrared once-imaging OCT method for retina artery vein classification.

#### **School of Brain Science and Brain Medicine, Zhejiang University**

October 2021 – September 2023

- Mentor: Prof. Ke Si & Prof. Wei Gong
- During this period, I was trained in developing optical systems. I carried out three projects: (1) Ultrasound-encoded wavefront sensing. I spent half a year building the ultrasound-encoded heterodyne wavefront sensing system, which can measure light wavefront at the ultrasound focus at high speed and is dedicated to performing digital phase conjugation. (2) deep-learning-based adaptive optics. I built a demo system for wavefront sensing with a Shack-Hartmann wavefront sensor. I also integrated a deep neural network into the software I developed for fast aberration measurement. This system is dedicated to a two-photon microscope for optogenetic studies. (3) multi-mode fiber imaging. I built a wavefront shaping system through a multi-mode fiber based on DMD/SLM. Based on the transmission matrix measurement, I achieved high PBR optical focusing through the multi-mode fiber. This system is dedicated to performing focus scanning fluorescence imaging for neuron imaging and stimulation.

## PROJECT EXPERIENCE

---

#### **Chu Kochen Honors College Deep Research Project**

July 2020 – July 2021

- In this program, I lead a four-student team to perform deep-learning-based action recognition in an embedded system. We developed with Python and C++, utilizing OpenPose and STGCN that were deployed on a development board, achieving real-time human action recognition.

#### **Student Research Training Program (SRTP), Zhejiang University**

July 2020 – July 2021

- I collaborated closely with two students at the College of Computer Science and Technology, Zhejiang University in this program. We did a survey on augmented reality (AR) techniques. We also developed a simple AR demonstration APP and wrote a mini-review. The review includes object tracking techniques, interaction techniques, and illumination techniques, which are fundamental techniques of AR.

## HONORS & AWARDS

---

- First Prize Scholarship of the Chinese Instrumentation and Measurement Society in 2022
- Top Ten New Academic Achievements of Zhejiang University Students in 2022
- Outstanding graduates of Zhejiang University
- First-class scholarship of Zhejiang University in 2022
- Outstanding League cadres at the school level of Zhejiang University
- Meritorious Winner on 2021 Interdisciplinary Contest In Modeling (ICM)
- Meritorious Winner on 2020 Interdisciplinary Contest In Modeling (ICM)
- First Prize of 2020 Zhejiang Province Physics Innovation Competition

## TECHNICAL SKILLS

---

- Coding: Python, MATLAB, C/C++, Kotlin
- Engineering: SolidWorks, Zemaxs, Optical System Building