Longqian Huang

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Education

Chu Kochen Honors College, Zhejiang University — China
Bachelor of Opto-electronic Information Science and Engineering — *Sept. 2018 – May 2022*

- GPA: 3.94/4.00

School of Brain Science and Brain Medicine, Zhejiang University — China
PhD of Neuroscience — *Sept. 2022 –*

- Instructor: Dr. Wei Gong & Prof. Ke Si

Research Interests

- Fiber-based Optogenetics
- 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 Department, Zhejiang University — Sept 2019 – Dec 2020

- Advisor: Xing Chen
- Researched in dynamic 3D holographic display. First took about half a year to conduct basic experiments of semiconductor laser holography, using holographic dry plate, self-prepared developer and fixer for object recording and display. Then turned to digital holography. I developed a MATLAB software to generate computed holography graph and used spatial light modulator (SLM) to perform phase modulation. We finally achieved dynamic 3D holographic display with good quality.

State Key Lab of Modern Optical Instrumentation, Zhejiang University — January 2020 – July 2021

- Menter: Xu Liu & Xiang Hao
- We explored 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 $\sim$ 10 times improvement regarding noise tolerance. I participated in most of the experimental works, and the article was received by Light: Science & Applications.

State Key Lab of Modern Optical Instrumentation, Zhejiang University — Febrary 2020 – June 2021

- Menter: Xu Liu & Xiang Hao

- I conducted a survey about deep learning–empowered spectral imaging, categorizing them into amplitude-coded, phase-coded and wavelength-coded, based on the foundamental property of light. The survey was written as a review article which was received by Light: Science & Applications.

State Key Lab of Modern Optical Instrumentation, Zhejiang University July 2021 – August 2021

- Menter: Xu Liu & Xiang Hao
- Research in 3D polarization imaging. We used simulated natural light to illuminate object, and placed a polarizer in front of the camera sensor to capture polarization image. By utilizing the polarization property of light, we successfully reconstructed 3D shape of the experimented object.

International research center for advanced photonics, Zhejiang University June 2021 – Present

- Mentor: Peng Li
- We leveraged optical coherence tomography (OCT) and optical coherence tomography angiography (OCTA) to research into the vascular property of mouse retina. The research is aimed at developing a near-infrared once-imaging OCT method for retina artery vein classification. It is still in progress.

National Frontier Science Center for Brain and Brain-computer Fusion, Zhejiang University
October 2021 – Present

- Mentor: Ke Si & Wei Gong
- I am currently focusing on developing optogenetic systems for neuroscience, including digital optical phase conjugation for deep focusing, learning-based adaptive optics for fast aberration correction and multi-mode fiber-based optogenetics.

Project Experience

Huawei Ascend & Chu Kochen Honors College Deep Research Project July 2020 – July 2021

- I was the project leader and we investigated deep learning techniques to perform human action recognition. We developed with C++ code and finally deployed on Ascend development board, achieving real-time human action recognition.

Student Research Training Program (SRTP), Zhejiang Univirsity July 2020 – July 2021

- We did a survey on augmentd reality (AR) techniques. We 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)
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- First Prize of 2020 Zhejiang Province Physics Innovation Competition