HAOWEN ZHOU

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EDUCATION

California Institute of Technology — Pasadena CA, USA
Ph.D. Program in Electrical Engineering — July 2021 – Present
M.S. in Electrical Engineering — July 2021 – June 2024

- Naren and Vinita Gupta Fellow | SPIE Optics and Photonics Scholarship
- Advised by Prof. Changhuei Yang

University of Dayton — Dayton OH, USA
M.S. in Electro-Optics and Photonics — Aug 2019 – May 2021

- Dean's Fellow
- Advised by Prof. Partha Banerjee

Huazhong University of Science and Technology — Wuhan, China
B.E. in Optoelectronics — Aug 2015 – June 2019

- Outstanding Graduate Award and Outstanding Graduate Thesis Award
- Advised by Prof. Wenxi Liang and Prof. Partha Banerjee

SELECTED AWARDS

SPIE Optics and Photonics Scholarship — 2024
- Society of Photographic Instrumentation Engineering (SPIE)

Gupta Sensing to Intelligence Fellowship — 2022
- Inaugural cohort of Naren and Vinita Gupta Fellow with two-year financial support
- California Institute of Technology

Student Author Travel Grant — 2021
- SPIE Photonics West

Dean's Fellowship — 2019
- Top in class with two-year financial support
- University of Dayton

Outstanding Undergraduate Award — 2019
- Top 10% in the class
- Huazhong University of Science and Technology

Outstanding Thesis Award — 2019
- Top 2 in the class
- School of Engineering Sciences | Huazhong University of Science and Technology

Freshman Scholarship 2016

- Top 10% in the class
- School of Engineering Sciences | Huazhong University of Science and Technology

PUBLICATIONS

arXiv / bioRxiv papers [* indicates equal contribution]

1. H. Zhou*, S. Lin*, M. Watson, C. T. Bernadt, O. Zhang, R. Govindan, R. J. Cote, and C. Yang, "Length-scale study in deep learning prediction for non-small cell lung cancer brain metastasis" arXiv https://arxiv.org/abs/2406.00555 (2024)
2. O. Zhang*, H. Zhou*, B. Y. Feng, E. M. Larsson, R. E. Alcalde, S. Yin, C. Deng, and C. Yang, "Single-shot volumetric fluorescence imaging with neural fields," arXiv https://arxiv.org/abs/2405.10463 (2024).

Journal Papers [* indicates equal contribution]

3. (In press) O. Zhang*, R. E. Alcalde*, H. Zhou, S. Yin, D. K. Newman, and C. Yang, "Investigating 3D microbial community dynamics of the rhizosphere using quantitative phase and fluorescence microscopy," Proc. Natl. Acad. Sci. (2024).
4. Siyuan Yin, Ruizhi Cao, Mingshu Liang, Cheng Shen, Haowen Zhou, Oumeng Zhang, and Changhuei Yang, "Can deep neural networks work with amplitude and phase input of defocused images?" Opt. Express 32, 25036-25045 (2024).
5. H. Zhou*, M. Watson*, C. T. Bernadt, S. Lin, C. Lin, J.H. Ritter, A. Wein, S. Mahler, S. Rawal, R. Govindan, C. Yang, and R. J. Cote, "AI-guided histopathology predicts brain metastasis in lung cancer patients," J. Pathol. 263, 89-98 (2024).
6. H. Zhou*, B. Y. Feng*, H. Guo, S. Lin, M. Liang, C. A. Metzler, C. Yang, "FPM-INR: Fourier ptychographic microscopy image stack reconstruction using implicit neural representations," Optica 10, 1679-1687 (2023).
7. C. Shen, S. Rawal, R. Brown, H. Zhou, A. Agarwal, M. Watson, R.J. Cote, and C. Yang, "Automatic detection of circulating tumor cells and cancer associated fibroblasts using deep learning," Sci. Rep. 13, 5708 (2023).
8. H. Zhou, C. Shen, M. Liang, C. Yang, "Analysis of post-reconstruction digital refocusing in Fourier ptychographic microscopy," Opt. Eng. 61, 073102 (2022).
9. H. Zhou, M.M.R. Hussain, P. P. Banerjee, "A review of the dual-wavelength technique for phase imaging and 3D topography," Light Adv. Manuf. 3, 1-21 (2022).
10. H. Zhou, H. Guo, and P. P. Banerjee, "Non-recursive transport of intensity phase retrieval with the transport of phase," Appl. Opt. 61, B190-B199 (2022).
11. H. Guo, H. Zhou, P. P. Banerjee, "Use of structured light in 3D reconstruction of transparent objects," Appl. Opt. 61, B214-B324 (2022).
12. H. Zhou, E. Stoykova, M. Hussain, and P. P. Banerjee, "Performance analysis of phase retrieval using transport of intensity with digital holography," Appl. Opt. 60, A73-A83 (2020).
13. H. Guo, H. Zhou, and P. P. Banerjee, "Single-shot digital phase-shifting Moiré patterns for 3D topography," Appl. Opt. 60, A84-A92 (2020).

14. H. Zhou, X. Sui, L. Cao, and P. P. Banerjee, "Digital correlation of computer-generated holograms for 3D face recognition," Appl. Opt. 58, G177-G186 (2019).

15. B. Bordbar, H. Zhou, P. P. Banerjee, "3D object recognition through processing of 2D holograms," Appl. Opt. 58, G197-G203 (2019).

16. Q. Li, J. Wu, L. Huang, J. Gao, H. Zhou, Y. Shi, Q. Pan, G. Zhang, Y. Du, and W. Liang, "Sulfur dioxide gas-sensitive materials based on zeolitic imidazolate framework-derived carbon nanotubes," J. Mater. Chem. A. 6, 12115-12124 (2018).

Conference Proceedings

1. O. Zhang, R. E. Alcalde, H. Zhou, S. Yin, and C. Yang, "Complex-field and fluorescence microscopy using aperture scanning technique (CFAST) for studying rhizosphere organisms" Proc. SPIE, PC1284802 (2024).

2. C. Shen, H. Zhou, C. Yang, "Non-interferometric and non-iterative complex wave-field reconstruction based on Kramers-Kronig relations," Proc. SPIE, 11970, 1197002 (2022).

3. H. Zhou and P. P. Banerjee, "Transport of intensity phase imaging with error correction using transport of phase equation," Proc. SPIE 11709, 117090D (2021).

4. H. Zhou, E. Stoykova, and P.P. Banerjee, "Phase retrieval using transport of intensity with off-axis digital holography for objects with large phase excursions", HF2D.5, Digital Holography and 3D Imaging, OSA (2020).

5. E. Stoykova, H. Zhou, and P.P. Banerjee, "Phase retrieval by transport of intensity in inline digital holography", HF2D.3, Digital Holography and 3D Imaging, OSA (2020).

6. H. Guo, H. Zhou, and P. P. Banerjee, "Single-shot Digital Phase-shifting Moiré Pattern for 3D Metallic Surface Imaging," HF3G.3, Digital Holography and 3D Imaging, OSA (2020).

7. H. Gao, H. Fang, J. Liu, H. Zhou, X. Cheng, S. Ding, J. Luo, S. Li, Z. Dai, and P.P. Banerjee, "A scanning method based on parabolic mirror and galvanometer for holographic contact copying," HTh4H.1, Digital Holography and 3D Imaging, OSA (2020).

8. H. Zhou, R. Hou, B. Bordbar, and P. P. Banerjee, "Effect of hologram windowing on correlation of 3D objects," Th2B.8, Digital Holography and 3D Imaging, OSA (2019).

9. H. Zhou, R. Hou, B. Bordbar, and P. P. Banerjee, "Effect of hologram size on 3D reconstruction using multi-wavelength digital holography," W4B.2, Digital Holography and 3D Imaging, OSA (2019).

10. P. P. Banerjee, U. Abeywickrema, H. Zhou, M. S. Alam, G. Nehmetallah, J. Khoury, L. Cao, "Taking correlation from 2D to 3D: optical methods and performance evaluation," Proc. SPIE 10995, 10995-10 (2019).

11. H. Zhou, U. Abeywickrema, B. Bordbar, L. Cao, P. P. Banerjee, "Correlation of holograms for surface characterization for diffuse objects," Proc. SPIE 10943, 10943-3 (2019).

PRESENTATIONS AND TALKS

1. "Fourier ptychographic microscopy image stack reconstruction using implicit neural representation" SPIE Photonics West (2024)

2. **[Invited]** "Improving pathology and life science research by leveraging computational microscopy and machine learning" SPIE Photonics West (2024)

3. "Transport of intensity phase imaging with error correction using transport of phase equation" Virtual, SPIE Photonics West (2021)

4. “Direct phase retrieval using digital holography with transport of intensity” Power-Haus Seminar at University of Dayton (2020)
5. “Correlation of holograms for surface characterization of diffuse objects” SPIE Photonics West (2019)

PROFESSIONAL SERVICES

Journal Reviewer

- Light: Science and Applications
- Advanced Photonics
- Photonics Research
- Optics Letters
- Biomedical Optics Express
- Journal of the Optical Society of America A
- Optics Express
- Applied Optics
- Optics Communication
- Nature Scientific Reports
- Optical Engineering

Professional Societies

- Society of Photographic Instrumentation Engineering (SPIE) | Student Member 2018-Present
- Optica (formerly known as OSA) | Student Member 2018-Present
- IEEE Photonics Society | Student Member 2022

Professional Societies Services

- President of SPIE student chapter of University of Dayton 2020-2021
- President of Optica student chapter at University of Dayton 2020-2021

Technical Events

- The host of Power-Haus series seminars at University of Dayton 2021

TEACHING EXPERIENCE

Teaching Assistant

- Caltech EE151 Electromagnetic Engineering [Head TA] 2024 Spring
- Caltech EE151 Electromagnetic Engineering [Head TA] 2023 Spring

Lab Tutorial

- Lecture on phase imaging for new students at Caltech Biophotonics Lab 2024

Student Mentoring

- Steven Lin [Graduate student in Electrical Engineering, Caltech]
- Siyuan Yin [Graduate student in Medical Engineering, Caltech]
- Shi Zhao [Graduate student in Electrical Engineering, Caltech]
- Catherine Deng [Undergraduate in Electrical Engineering, Caltech]