

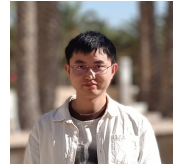
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🌐 github.com/LiuX2018

🎓 Google Scholar

🌐 liux2018.github.io



Research Interests

Computational Optics, with a particular focus on *Optics Simulator*, *Light Shaping*, *Computational Imaging*, *Adaptive Optics*, *Far-field Optical Microscopy (Nanoscopy)*, and *Optical Manufacturing*.

Research Experience

- 2024/04 – Present  **The University of Hong Kong**, Hong Kong SAR, China
Department of Electrical and Electronic Engineering
Postdoctoral Fellow
Advisor: Prof. Yifan Peng
- 2024/01 – 2024/03  **Zhejiang University**, Hangzhou, China
College of Optical Science and Engineering
Research Assistant
Advisors: Prof. Xiang Hao & Prof. Cuifang Kuang & Prof. Xu Liu

Education

- 2018/09 – 2023/12  **Zhejiang University**, Hangzhou, China
Ph.D. in Optical Engineering
Advisors: Prof. Xiang Hao & Prof. Cuifang Kuang & Prof. Xu Liu
- 2022/12 – 2023/03  **The University of Hong Kong**, Hong Kong SAR, China
Research Postgraduate Visiting Student in Electrical and Electronic Engineering
Advisor: Prof. Yifan Peng
- 2014/09 – 2018/06  **South China University of Technology**, Guangzhou, China
B.E. in Optoelectronic Information Science and Engineering

Representative Publications

(*Equal contributors; †Corresponding authors)

- 1 Y. Hu*, **X. Liu***,†, X. Liu, and X. Hao†, “Diffraction modeling between arbitrary planes using angular spectrum rearrangement,” *Optica*, vol. 12, no. 1, pp. 39–45, 2025, (IF = 8.4), [Monthly Top Downloads].
- 2 **X. Liu**, S. Tu, Y. Hu, Y. Peng, Y. Han, C. Kuang, X. Liu, and X. Hao, “In situ fully vectorial tomography and pupil function retrieval of tightly focused fields,” *Nature Communications*, vol. 16, no. 1, p. 3478, 2025, (IF = 14.7).
- 3 **X. Liu**, Y. Hu, S. Tu, C. Kuang, X. Liu, and X. Hao, “Fast generation of arbitrary optical focus array,” *Optics and Lasers in Engineering*, vol. 162, p. 107 405, 2023, (IF = 3.5).
- 4 H. Wei*, **X. Liu***, X. Hao, E. Y. Lam, and Y. Peng, “Modeling off-axis diffraction with the least-sampling angular spectrum method,” *Optica*, vol. 10, no. 7, pp. 959–962, 2023, (IF = 8.4), [Monthly Top Downloads].
- 5 **X. Liu**, S. Tu, C. Kuang, X. Liu, and X. Hao, “Calibration of phase-only liquid-crystal spatial light modulators by diffractogram analysis,” *Optics and Lasers in Engineering*, vol. 156, p. 107 056, 2022, (IF = 3.5).

- 6 **X. Liu***, L. Li*, X. Liu, X. Hao, and Y. Peng, "Investigating deep optics model representation in affecting resolved all-in-focus image quality and depth estimation fidelity," *Optics Express*, vol. 30, no. 20, pp. 36 973–36 984, 2022, (IF = 3.2).
- 7 **X. Liu**, Y. Peng, S. Tu, J. Guan, C. Kuang, X. Liu, and X. Hao, "Generation of arbitrary longitudinal polarization vortices by pupil function manipulation," *Advanced Photonics Research*, vol. 2, no. 1, p. 2 000 087, 2021, (IF = 3.7), [Cover Story].
- 8 **X. Liu**, S. Tu, Y. Xu, H. Song, W. Liu, Q. Liu, C. Kuang, X. Liu, and X. Hao, "Aberrations in structured illumination microscopy: A theoretical analysis," *Frontiers in Physics*, vol. 7, no. 254, 2020, (IF = 1.9).

Honors & Achievements

- | | |
|------|---|
| 2024 | <ul style="list-style-type: none"> 📖 Nomination Award at the Three-Year Achievement Exhibition of Computational Imaging, Chinese Society for Optical Engineering. In recognition of contributions in optics simulators and computational imaging. |
| 2022 | <ul style="list-style-type: none"> 📖 Individual scholarship for innovation and entrepreneurship, Zhejiang University. 📖 Junshi Chen scholarship, Zhejiang University. 📖 Outstanding graduate student, Zhejiang University. 📖 Merit graduate student, Zhejiang University. |
| 2021 | <ul style="list-style-type: none"> 📖 Junshi Chen scholarship, Zhejiang University. 📖 Outstanding graduate student, Zhejiang University. 📖 Merit graduate student, Zhejiang University. 📖 Outstanding graduate student cadres, Zhejiang University. |
| 2020 | <ul style="list-style-type: none"> 📖 Junshi Chen scholarship, Zhejiang University. 📖 Outstanding graduate student cadres, Zhejiang University. |
| 2019 | <ul style="list-style-type: none"> 📖 Outstanding graduate student, Zhejiang University. |
| 2015 | <ul style="list-style-type: none"> 📖 Third-class award on 3rd Physics Tournament of SCUT, South China University of Technology. |






Reviewer Service

- 📖 Optica, Laser & Photonics Review, Advanced Science, Optics Letters, Optics Express, Journal of Microscopy, and Optics Communications.
- 📖 Siggraph (Asia) and ICCP



Conference Presentations & Invited Talks

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|---------|---|
| 2024/09 | <ul style="list-style-type: none"> 📖 The 4th International Conference on Computational Imaging, Xiamen, China
Invited talk "Free-space wave propagation modeling with least-sampling angular spectrum method" |
| 2024/05 | <ul style="list-style-type: none"> 📖 Guest Lecture, King Abdullah University of Science and Technology, Saudi Arabia
Invited talk "Exploring wave propagation modeling in free space" |




Teaching Experience & Mentorship

- 2022 – 2025  **Student Mentorship**
Doctoral Thesis: “Joint Design of Optics and Algorithms for Large-FoV Imaging”, Haoyu Wei, *The University of Hong Kong*
Paper: H. W*, **X. Liu***, et al., *Optica* 2023
- 2021 – 2024  **Student Mentorship**
Doctoral Thesis: “Manipulation and Characterization of Optical Field with Differentiable Optics”, Yiwen Hu, *Zhejiang University*
Paper: Y. H*, **X. Liu***[†], et al., *Optica* 2025
- 2023  **Student Mentorship**
Master Thesis: “Deep Stereo Optics Imaging for High Fidelity Depth Estimation”, Yuhui Liu, *The University of Hong Kong*
- 2022  **Student Mentorship**
Undergraduate Thesis: “Full Vectorial Manipulation of Tightly Focused Optical Field”, Haiwei Wang, *Zhejiang University*
-  **Remote Student Mentorship**
Undergraduate Thesis: “Numerical Simulation of Vectorial Field Based on Vectorial Diffraction Theory”, Yunpeng Wang, *Changchun University of Science and Technology*

Granted Patents

-  Xiang Hao, **Xin Liu**, Cuifang Kuang, Xu Liu, “A Method for Point Spread Function Reconstruction”, CN110133849B, National Invention Patent of China.
-  Xiang Hao, **Xin Liu**, Shijie Tu, Xu Liu, “A Two-Dimensional Rapid Beam Scanning Module for Confocal Fluorescence Microscopy”, CN109491065A, National Invention Patent of China.
-  Xu Liu, **Xin Liu**, Xiang Hao, Cuifang Kuang, Haifeng Li, “A Device for Common-path Beam Modulation in Imaging and Lithography Systems”, CN110568650B, National Invention Patent of China.
-  Xiang Hao, **Xin Liu**, Yubing Han, Cuifang Kuang, Xu Liu, “A Method and Device for Calibration of Phase-only Spatial Light Modulators”, CN112697401A, National Invention Patent of China.
-  Xiang Hao, **Xin Liu**, Cuifang Kuang, Xu Liu, “A Device for Generating Super-resolution Optical Focus Arrays”, CN110568731B, National Invention Patent of China.
-  Xiang Hao, Shijie Tu, **Xin Liu**, Xu Liu, “A Multicolor Super-Resolution Microscope with Automatic Alignment Capability”, CN109358030B, National Invention Patent of China.

Skills

- Basic  Optics and Machine Learning.
- Coding  MATLAB, Python, LabVIEW, and \LaTeX .
- Languages  English (Good reading, writing and speaking); Mandarin (Native).

References

Prof. Xiang Hao

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