

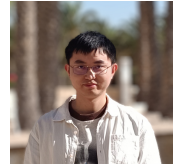
# LIU, XIN

✉ liuxin.optics@gmail.com

🌐 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), [Monthly Top Downloads].
- 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. 107405, 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. 107056, 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"> <li>📖 <b>Nomination Award at the Three-Year Achievement Exhibition of Computational Imaging</b>, Chinese Society for Optical Engineering. In recognition of contributions in optics simulators and computational imaging.</li> </ul>   |
| 2022 | <ul style="list-style-type: none"> <li>📖 <b>Individual scholarship for innovation and entrepreneurship</b>, Zhejiang University.</li> <li>📖 <b>Junshi Chen scholarship</b>, Zhejiang University.</li> <li>📖 <b>Outstanding graduate student</b>, Zhejiang University.</li> <li>📖 <b>Merit graduate student</b>, Zhejiang University.</li> </ul> |
| 2021 | <ul style="list-style-type: none"> <li>📖 <b>Junshi Chen scholarship</b>, Zhejiang University.</li> <li>📖 <b>Outstanding graduate student</b>, Zhejiang University.</li> <li>📖 <b>Merit graduate student</b>, Zhejiang University.</li> <li>📖 <b>Outstanding graduate student cadres</b>, Zhejiang University.</li> </ul>                        |
| 2020 | <ul style="list-style-type: none"> <li>📖 <b>Junshi Chen scholarship</b>, Zhejiang University.</li> <li>📖 <b>Outstanding graduate student cadres</b>, Zhejiang University.</li> </ul>  |
| 2019 | <ul style="list-style-type: none"> <li>📖 <b>Outstanding graduate student</b>, Zhejiang University.</li> </ul>   |
| 2015 | <ul style="list-style-type: none"> <li>📖 <b>Third-class award on 3rd Physics Tournament of SCUT</b>, South China University of Technology.</li> </ul>   |






## 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

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




## 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**\*<sup>†</sup>, 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  $\text{\LaTeX}$ .
- Languages      English (Good reading, writing and speaking); Mandarin (Native).

## References

**Prof. Xiang Hao**

Professor

Zhejiang University,  
38 Zheda Road, Hangzhou,  
China.

✉ haox@zju.edu.cn

**Prof. Xu Liu**

Professor

Zhejiang University,  
38 Zheda Road, Hangzhou,  
China.

✉ liuxu@zju.edu.cn

**Prof. Yifan Peng**

Professor

The University of Hong Kong,  
Pokfulam, Hong Kong,  
China.

✉ evanpeng@hku.hk

**Prof. Cuifang Kuang**

Professor

Zhejiang University,  
38 Zheda Road, Hangzhou,  
China.

✉ cfkuang@zju.edu.cn