

# Xin Liu

## Curriculum Vitae

Department of Electrical and Electronic Engineering

The University of Hong Kong

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### Education and Experience

- since 04/24 **Postdoctoral Researcher**, *Department of Electrical and Electronic Engineering, The University of Hong Kong (HKU)*, Hong Kong SAR, China.  
Computational Optics; Optics Simulator; Light Shaping; Computational Imaging; Adaptive Optics; Far-field Optical Microscopy (Nanoscopy); Optical Manufacturing
- 01/24 – 03/24 **Research Assistant**, *State Key Laboratory of Extreme Photonics and Instrumentation, Zhejiang University (ZJU)*, Hangzhou, China.
- 09/18 – 12/23 **Ph.D., Optical Engineering**, *State Key Laboratory of Extreme Photonics and Instrumentation, Zhejiang University (ZJU)*, Hangzhou, China.  
Thesis: Research on principles and key issues of point spread function engineering
- 09/14 – 06/18 **B.E., Optoelectronic Information Science and Engineering**, *South China University of Technology (SCUT)*, Guangzhou, China.

### Journal Publications (selected)

(\*Equal contributors; ✉Corresponding authors)

- [11] **Retained accuracy with reduced precision in wave propagation modeling.** Xin Liu and Yifan Peng. 2026, *Photonics Research*, (IF: 7.2). [In press].
- [10] **Learned off-aperture encoding for wide field-of-view RGBD imaging.** Haoyu Wei, Xin Liu, Yuhui Liu, Qiang Fu, Wolfgang Heidrich, Edmund Y. Lam, and Yifan Peng. 2025, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, (IF: 20.4).
- [9] **In situ fully vectorial tomography and pupil function retrieval of tightly focused fields.** Xin Liu, Shijie Tu, Yiwen Hu, Yifan Peng, Yubing Han, Cuifang Kuang, Xu Liu, and Xiang Hao. 2025, *Nature Communications*, (IF: 17.2).
- [8] **Diffraction modeling between arbitrary planes using angular spectrum rearrangement.** Yiwen Hu\*, Xin Liu\*✉, Xu Liu, and Xiang Hao✉. 2025, *Optica*, (IF: 10.1). [Monthly Top Downloads].
- [7] **Modeling off-axis diffraction with the least-sampling angular spectrum method.** Haoyu Wei\*, Xin Liu\*, Xiang Hao, Edmund Y. Lam, and Yifan Peng. 2023, *Optica*, (IF: 10.1). [Monthly Top Downloads].
- [6] **Fast generation of arbitrary optical focus array.** Xin Liu, Yiwen Hu, Shijie Tu, Cuifang Kuang, Xu Liu, and Xiang Hao. 2023, *Optics and Lasers in Engineering*, (IF: 4.4).
- [5] **Calibration of phase-only liquid-crystal spatial light modulators by diffractogram analysis.** Xin Liu, Shijie Tu, Cuifang Kuang, Xu Liu, and Xiang Hao. 2022, *Optics and Lasers in Engineering*, (IF: 4.4).
- [4] **Investigating deep optics model representation in affecting resolved all-in-focus image quality and depth estimation fidelity.** Xin Liu, Linpei Li, Xu Liu, Xiang Hao, and Yifan Peng. 2022, *Optics Express*, (IF: 3.5).

- [3] **Accurate background reduction in adaptive optical three-dimensional stimulated emission depletion nanoscopy by dynamic phase switching.** Shijie Tu, Xin Liu, Difu Yuan, Wenli Tao, Yubing Han, Yan Shi, Yanghui Li, Cuifang Kuang, Xu Liu, Yufeng Yao, Yesheng Xu, and Xiang Hao. 2022, *ACS Photonics*, (IF: 6.9). [On the Cover].
- [2] **Generation of arbitrary longitudinal polarization vortices by pupil function manipulation.** Xin Liu, Yifan Peng, Shijie Tu, Jun Guan, Cuifang Kuang, Xu Liu, and Xiang Hao. 2021, *Advanced Photonics Research*, (IF: 3.9). [On the Cover].
- [1] **Aberrations in structured illumination microscopy: A theoretical analysis.** Xin Liu, Shijie Tu, Yan Xu, Hongya Song, Wenjie Liu, Qiulan Liu, Cuifang Kuang, Xu Liu, and Xiang Hao. 2020, *Frontiers in Physics*, (IF: 2.5).

## Awards

- 2025 **Outstanding Young Rising Star Awards (1/20), The 5th International Conference on Computational Imaging (CITA 2025)**, Chinese Society for Optical Engineering.
- 2024 **Honorable Mention**, *The three-year achievement exhibition of computational imaging*, The 4th International Conference on Computational Imaging (CITA 2024), Chinese Society for Optical Engineering.
- 2022 **Individual Scholarship for innovation and entrepreneurship**, Zhejiang University.
- 2022 **Junshi Chen Scholarship**, Zhejiang University.
- 2022 **Outstanding Graduate Student**, Zhejiang University.
- 2022 **Merit Graduate Student**, Zhejiang University.
- 2021 **Junshi Chen Scholarship**, Zhejiang University.
- 2021 **Outstanding Graduate Student**, Zhejiang University.
- 2021 **Merit Graduate Student**, Zhejiang University.
- 2021 **Outstanding Graduate Student Cadres**, Zhejiang University.
- 2020 **Junshi Chen Scholarship**, Zhejiang University.
- 2020 **Outstanding Graduate Student Cadres**, Zhejiang University.
- 2019 **Outstanding Graduate Student**, Zhejiang University.

## Invited Talks

- 2025/09 **Exploring advanced imaging with computational optics**, *The 5th International Conference on Computational Imaging (CITA 2025)*, Suzhou, China.
- 2024/09 **Free-space wave propagation modeling with least-sampling angular spectrum method**, *The 4th International Conference on Computational Imaging (CITA 2024)*, Xiamen, China.
- 2024/05 **Exploring wave propagation modeling in free space**, Guest Lecture, King Abdullah University of Science and Technology, Saudi Arabia.

## Student Mentorship

- 2022 – 2025 **PhD Thesis**, “Learned wide-angle imaging with optical modeling and optimization”, Haoyu Wei, The University of Hong Kong.
- 2021 – 2025 **PhD Thesis**, “Characterization of optical field with computational methods”, Yiwen Hu, Zhejiang University.

- 2023 **Master's Thesis**, "Deep stereo optics imaging for high fidelity depth estimation", Yuhui Liu, The University of Hong Kong.
- 2022 **Bachelor's Thesis**, "Full vectorial manipulation of tightly focused optical field", Haiwei Wang, Zhejiang University.
- 2022 **Bachelor's Thesis**, "Numerical simulation of vectorial field based on vectorial diffraction theory", Yunpeng Wang, Changchun University of Science and Technology.

## Service

- Reviewer** Optica; SIGGRAPH (Asia); Advanced Functional Materials; International Conference on Computational Photography (ICCP); Laser & Photonics Reviews; Advanced Science; Optics Letters; Optics Express; JOSA A; JOSA B; Applied Optics; Journal of Microscopy; Optics Communications
- Committee** The 5th International Conference on Computational Imaging (CITA 2025)
- Coordinator** HKU-KAUST Joint Postgraduate Workshop on Computational Imaging 2025

## Patents

- 2022 **A method and device for calibration of phase-only spatial light modulators**, Xiang Hao, Xin Liu, Yubing Han, Cuifang Kuang, Xu Liu, CN112697401A.
- 2020 **A method for point spread function reconstruction**, Xiang Hao, Xin Liu, Cuifang Kuang, Xu Liu, CN110133849B.
- 2020 **A two-dimensional rapid beam scanning module for confocal fluorescence microscopy**, Xiang Hao, Xin Liu, Shijie Tu, Xu Liu, CN109491065A.
- 2020 **A device for common-path beam modulation in imaging and lithography systems**, Xu Liu, Xin Liu, Xiang Hao, Cuifang Kuang, Haifeng Li, CN110568650B.
- 2020 **A device for generating super-resolution optical focus arrays**, Xiang Hao, Xin Liu, Cuifang Kuang, Xu Liu, CN110568731B.
- 2020 **A multicolor super-resolution microscope with automatic alignment capability**, Xiang Hao, Shijie Tu, Xin Liu, Xu Liu, CN109358030B.

## Referees

**Prof. Yifan Peng**  
The University of Hong Kong  
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**Prof. Xu Liu**  
*OPTICA, SPIE Fellow*  
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**Prof. Wolfgang Heidrich**  
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**Prof. Nicholas X. Fang**  
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