Shiqi Chen, Ph.D.

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Los Angeles, California, USA

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Research Interests

My research focuses on advancing intelligent optical systems at the intersection of optics and machine learning. I pioneered the world's first optical generative models, enabling energy-efficient generative AI with significantly reduced power consumption and carbon footprint. Previously, I led computational optics projects that were deployed in Huawei flagship devices, enabling high-quality imaging performance under tight hardware and computational constraints.

Education

Zhejiang University — *Hangzhou, Zhejiang, China*
Ph.D. in Optical Engineering. Advisor: Prof. Huajun Feng and Prof. Zhihai Xu — *Sep. 2018 - Jun. 2023*
- Dissertation: "Research on extreme quality computational photography technology for non-ideal imaging system".

Huazhong University of Science and Technology — *Wuhan, Hubei, China*
B.S. in Optical Engineering — *Sep. 2014 - Jun. 2018*

Academic Appointments

University of California, Los Angeles — *Los Angeles, California, USA*
PostDoctral Scholar. Advisor: Prof. Aydogan Ozcan — *2024 - Present*

Publications

[1] Model-free optical processors using in situ reinforcement learning with proximal policy optimization — *Light: Science & Applications*
Yuhang Li, **Shiqi Chen**, Tingyu Gong, and Aydogan Ozcan — *2026*

[3] Massively parallel and universal approximation of nonlinear functions using diffractive processors — *eLight*
Md Sadman Sakib Rahman, Yuhang Li, Xilin Yang, **Shiqi Chen**, and Aydogan Ozcan — *2025*

[4] Optical generative models — *Nature*
Shiqi Chen, Yuhang Li, Yuntian Wang, Hanlong Chen, and Aydogan Ozcan — *2025*

[5] Diffractive snapshot spectral imaging needs long-range dependency — *Optics & Laser Technology*
Zhengyue Zhuge, Chi Zhang, Jiahui Xu, Qi Li, **Shiqi Chen**, and Yueting Chen — *2025*

[6] Successive Optimization of Optics and Post-Processing With Differentiable Coherent PSF Operator and Field Information — *IEEE Transactions on Computational Imaging*
Zheng Ren, Jingwen Zhou, Wenguan Zhang, Jiapu Yan, Bingkun Chen, Huajun Feng, and **Shiqi Chen*** — *2025*
  *corresponding author.

[7] Isotropic PSF modification for optimized optical lens design in image-matching tasks — *OSA Optics Express*
Bingkun Chen, Zheng Ren, Jingwen Zhou, Haoying Li, Hao Xu, Nan Xu, Huajun Feng, and **Shiqi Chen*** — *2025*
  *corresponding author.

[8] DualDn: Dual-domain denoising via differentiable ISP

RUIKANG LI, YUJIN WANG, **SHIQI CHEN**, FAN ZHANG, JINWEI GU, AND TIANFAN XUE

European Conference on Computer Vision (ECCV)

2025

[10] Video-Rate Spectral Imaging Based on Diffractive-Refractive Hybrid Optics

HAO XU, HAIQUAN HU, NAN XU, BINGKUN CHEN, PENG LUO, TINGTING JIANG, ZHIHAI XU, QI LI, **SHIQI CHEN**, AND YUETING CHEN

Laser & Photonics Reviews

2024

[11] End-to-end automatic lens design with a differentiable diffraction model

WENGUAN ZHANG, ZHENG REN, JINGWEN ZHOU, **SHIQI CHEN**, HUAJUN FENG, QI LI, ZHIHAI XU, AND YUETING CHEN

OSA Optics Express

2024

[12] Calibration-free deep optics for depth estimation with precise simulation

ZHENGYUE ZHUGE, HAO XU, **SHIQI CHEN**, JIAHUI XU, QI LI, HUAJUN FENG, ZHIHAI XU, AND YUETING CHEN

Optics and Lasers in Engineering

2024

[13] Wavelength encoding spectral imaging based on the combination of deeply learned filters and an RGB camera

HAO XU, **SHIQI CHEN**, HAIQUAN HU, PENG LUO, ZHEYAN JIN, QI LI, ZHIHAI XU, HUAJUN FENG, YUETING CHEN, AND TINGTING JIANG

OSA Optics Express

2024

[14] Deep Linear Array Pushbroom Image Restoration: A Degradation Pipeline and Jitter-Aware Restoration Network

ZIDA CHEN, ZIRAN ZHANG, HAOYING LI, MENGHAO LI, YUETING CHEN, QI LI, HUAJUN FENG, ZHIHAI XU, AND **SHIQI CHEN***
   *corresponding author.

AAAI 2024

2024

[15] Revealing the preference for correcting separated aberrations in joint optic-image design

JINGWEN ZHOU, **SHIQI CHEN***, ZHENG REN, WENGUAN ZHANG, JIAPU YAN, HUAJUN FENG, QI LI, AND YUETING CHEN
   *corresponding author.

Optics and Lasers in Engineering

2024

[16] Dark2Light: multi-stage progressive learning model for low-light image enhancement

RUI-KANG LI, MENG-HAO LI, **SHIQI CHEN***, YUE-TING CHEN, AND ZHI-HAI XU
   *corresponding author.

OSA Optics Express

2023

[17] Design of an optimized Alvarez lens based on the fifth-order polynomial combination

ZHICHAO YE, JIAPU YAN, TINGTING JIANG, **SHIQI CHEN**, ZHIHAI XU, HUAJUN FENG, QI LI, AND YUETING CHEN

OSA Applied Optics

2023

[18] Image restoration for optical zooming system based on Alvarez lenses

JIAPU YAN, ZHICHAO YE, TINGTING JIANG, **SHIQI CHEN**, HUAJUN FENG, ZHIHAI XU, QI LI, AND YUETING CHEN

OSA Optics Express

2023

[19] Reliable Image Dehazing by NeRF

ZHEYAN JIN, **SHIQI CHEN**, HUAJUN FENG, ZHIHAI XU, QI LI, AND YUETING CHEN

OSA Optics Express

2023

[21] Toward Real Flare Removal: A Comprehensive Pipeline and A New Benchmark

ZHEYAN JIN, **SHIQI CHEN**, HUAJUN FENG, ZHIHAI XU, AND YUETING CHEN

OSA Optics Express

2023

[22] Imaging Simulation and Learning-Based Image Restoration for Remote Sensing Time Delay and Integration Cameras

MENGHAO LI, ZIRAN ZHANG, **SHIQI CHEN**, ZHIHAI XU, QI LI, HUAJUN FENG, AND YUETING CHEN

IEEE Transactions on Geoscience and Remote Sensing

2023

[23] Computational Optics for Mobile Terminals in Mass Production

SHIQI CHEN, TING LIN, HUAJUN FENG, ZHIHAI XU, QI LI, AND YUETING CHEN

IEEE Transactions on Pattern Analysis and Machine Intelligence

2023

[24] Hyperspectral image reconstruction based on the fusion of diffracted rotation blurred and clear images

HAO XU, HAIQUAN HU, **SHIQI CHEN**, ZHIHAI XU, QI LI, TINGTING JIANG, AND YUETING CHEN

Optics and Lasers in Engineering

2023

[25] Direct distortion prediction method for AR-HUD dynamic distortion correction

FANGZHENG YU, NAN XU, **SHIQI CHEN**, HUAJUN FENG, ZHIHAI XU, QI LI, TINGTING JIANG, AND YUETING CHEN

OSA Applied Optics

2023

[26] Snapshot hyperspectral imaging based on equalization designed DOE

NAN XU, HAO XU, **SHIQI CHEN**, HAIQUAN HU, ZHIHAI XU, HUAJUN FENG, QI LI, TINGTING JIANG, AND YUETING CHEN

OSA Optics Express

2023

[27] Mobile image restoration via prior quantization

SHIQI CHEN, JINGWEN ZHOU, MENGHAO LI, YUETING CHEN, AND TINGTING JIANG

Pattern Recognition Letters

2023

[28] DR-UNet: dynamic residual U-Net for blind correction of optical degradation

JINWEN ZHOU, **SHIQI CHEN**, QI LI, TONGYUE LI, AND HUAJUN FENG

SPIE IMT (Infrared, Millimeter, Terahertz Waves and Applications)

2023

[29] Non-blind optical degradation correction via frequency self-adaptive and finetune tactics

TING LIN, **SHIQI CHEN***, HUAJUN FENG, ZHIHAI XU, QI LI, AND YUETING CHEN
  *corresponding author.

OSA Optics Express

2022

[30] SRDiff: Single image super-resolution with diffusion probabilistic models

HAOYING LI, YIFAN YANG, **SHIQI CHEN**, MENG CHANG, HUAJUN FENG, ZHIHAI XU, QI LI, AND YUETING CHEN

Neurocomputing

2022

[31] Epistemic-Uncertainty-Based Divide-and-Conquer Network for Single-Image Super-Resolution

JIAQI YANG, **SHIQI CHEN**, QI LI, TINGTING JIANG, YUETING CHEN, AND JING WANG

Electronics

2022

[32] Extreme-Quality Computational Imaging via Degradation Framework

SHIQI CHEN, HUAJUN FENG, KEMING GAO, ZHIHAI XU, AND YUETING CHEN

Proceedings of ICCV

2021

[33] Optical Aberrations Correction in Postprocessing Using Imaging Simulation

SHIQI CHEN, HUAJUN FENG, DEXIN PAN, ZHIHAI XU, QI LI, AND YUETING CHEN

ACM Transactions on Graphics (TOG)

2021

Honors & Awards

2025	**Outstanding Doctoral Dissertation Award**, Chinese Optical Society
2025	**Outstanding Doctoral Dissertation Award**, Chinese Optical Society of Zhejiang Province
2024	**Outstanding Doctoral Dissertation Award**, Zhejiang Province
2024	**Outstanding Doctoral Dissertation Award**, Zhejiang University
2023	**Outstanding Doctoral Dissertation Award**, College of Optical Science and Engineering, Zhejiang University
2023	**Excellent Graduate**, Zhejiang Province
2023	**Excellent Graduate**, Zhejiang University
2023	**2nd prize**, National Optics and Optical Engineering Doctoral Academic League
2023	**1st prize**, National Optics and Optical Engineering Doctoral Academic League (strait division)
2022	**1st prize**, Huawei Terminal Academic Star Competition
2022	**19th Daheng Wang Optical Award**, Chinese Optical Society
2022	**Light of Qiushi Top Ten Students**, Zhejiang University
2022	**Best Presentation Award**, International Post-graduate Photonics Forum (IPPF 2022)
2022	**Guoqiang Scholarship**, Zhejiang University
2021	**Caoguangbiao Scholarship, Advanced Individual of Social Experience**, Zhejiang University
2018	**Excellent Graduate**, Hubei Province and Huazhong University of Science and Technology

Presentation

SPIE Photonics West *San Fransisco, USA*
PRESENTER *Jan. 2026*
• Optical Generative Models

Pujiang Lab Workshop *Shanghai, China*
PRESENTER *Sep. 2023*
• Image Enhancement and Optical Simulation for Mobile Terminals

Chinese Optical Society Academic Conference *Wuhan, China*
PRESENTER *Jul. 2023*
• Extreme Image Quality Enhancement for Mobile Terminals

China Optical Academic Conference *Wuhan, China*
PRESENTER *Jul. 2023*
• Computational Optics for Mobile Terminals

IPPF (International Postgradudate Photonics Forum) 2022 *Hangzhou, China*
PRESENTER *Oct. 2022*
• Computational Optics for Mobile Terminals in Mass Production

SIGGRAPH 2022 *Vancouver, Canada (on site)*
PRESENTER *Aug. 2022*
• Optical Aberrations Correction using Imaging Simulation

Huawei Mobile Terminal Workshop *Hangzhou, China*
PRESENTER *Jun. 2022*
• Optical simulation for low-level computer vision

Professional service

Nature Communications, ACM TOG, IEEE TCSVT, OSA OE, Elsevier PRL, Wiley IPR, CVPR, ICCV, ECCV, SIGGRAPH
PEER REVIEWER

SPIE Photonics West