

JUN DAI

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 Profile |  Homepage |  GitHub |  Google Scholar

RESEARCH INTERESTS

Computer Vision, Computer Graphics, Computational Photography, Computational Imaging

EDUCATION





- **Zhejiang University** Aug. 2021 - Jun. 2024
M.Eng. | Optical Engineering
◦ GPA: 3.88/4.00
◦ Rank in Graduate Exam: 1/ 2K+
Hangzhou, China
- **Tianjin University** Aug. 2017 - Jun. 2021
B.Eng. | Electrical Engineering
◦ GPA: 3.76/4.00 (WES)
Tianjin, China

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

- [C.1] Jun Dai, Chong Li, Xiaowen Dong, Jianjun He, et al. (2023). **On-chip 4F-system based on concave mirrors for optical neural networks**. In *SPIE/COS Photonics Asia, Proceedings Volume 12768, Holography, Diffractive Optics, and Applications XIII*; SPIE. 2023, Beijing.
- [C.2] Jialin Cheng, Chong Li, Jun Dai, Yayan Chu, Xinxiang Niu, et al. (2024). **First experimental demonstration of highly scalable and reconfigurable optical convolution computing based on wavelength routing**. In *SPIE/COS Photonics Asia, Proceedings Volume 13237, Optical Design and Testing XIV; 132370X (2024)*; SPIE. 2024, Nantong.
- [J.1] Li Fan, Xilin Long, Jun Dai, Chong Li, Xiaowen Dong, et al. (2023). **Optical-electronic hybrid Fourier convolutional neural network based on super-pixel complex-valued modulation**. *Applied Optics*, Vol. 62, Issue 5, pp. 1337-1344 (2023).
- [J.2] Jialin Cheng, Chong Li, Jun Dai, Yayan Chu, Xinxiang Niu, et al. (2024). **Direct Optical Convolution Computing Based on Arrayed Waveguide Grating Router**. *Laser & Photonics Reviews*, Vol. 18, Issue 9.
- [T.1] Jun Dai (2024). **Optical convolutional neural networks based on planar waveguide devices**. *Master Thesis*
- [S.1] Jun Dai, Liqun Chen, Xinge Yang, Yuyao Hu, Jinwei Gu, Tianfan Xue, et al. (2024). **Tolerance-Aware Deep Optics**. Manuscript submitted for publication in *Conference on Computer Vision and Pattern Recognition, 2025*.
- [S.2] Liqun Chen, Yuxuan Li, Jun Dai, Jinwei Gu, Tianfan Xue (2024). **A Physics-Informed Blur Learning Framework for Imaging Systems**. Manuscript submitted for publication in *Conference on Computer Vision and Pattern Recognition, 2025*.






RESEARCH EXPERIENCE

- **Open Imaging Lab, Shanghai AI Laboratory**  Oct. 2023 - Present
Research Intern | Supervised by Prof. Tianfan Xue and Prof. Jinwei Gu
Shanghai, China
◦ Conducted **computational photography** and **3D vision** research
◦ By design **tolerance-aware optimization** make Deep Optics more robust (>2dB, in deblurring)
◦ Incorporated **event camera** for more efficient and fast 3D reconstruction
◦ Combine optics and new sensors with computer vision (submitted [S.1] and [S.2])
- **X-Dimensional Representations Lab, Zhejiang University**  Jun. 2023 - Oct. 2023
Research Intern | Supervised by Prof. Yiyi Liao
Hangzhou, China
◦ Conducted 3D vision research, **single-view 3D reconstruction and generation**.
◦ Incorporated **local geometry prior** into single-view 3D reconstruction
◦ Based on **NeRF** and **Gaussian Splatting** representations, improved quality of 3D reconstruction
◦ Using higher quality reconstruction results make autonomous drive platform more diverse
- **Advance Computing and Storage Laboratory, Huawei**  Mar. 2023 - Jun. 2023
Research Intern | Supervised by Dr. Chong Li
Shenzhen, China
◦ Conducted **optical computing** research, using AWGR devices for computing
◦ First design of optical computing by communication device (AWGR)
◦ Novelty designed **low-precision training** and **data splitting architecture**
◦ Implemented prototype of design, demonstrate **SOTA performance** on computation efficiency (see [J.2])
- **Integrated Opto-Electronics Lab, Tianjin University**  Dec.2020 - May. 2021
Research Intern | Supervised by Prof. Delong Zhang
Tianjin, China
◦ Conducted **integrated optics** research, optical waveguide simulation
◦ Designed an efficient computational framework for optical waveguide simulation
◦ Incorporated Runge-Kutta methods and Newton's method, solve wave propagation equation

SKILLS

- **Programming Languages:** Python | C++ | Java | Matlab
- **Technical:** PyTorch | OpenCV | OpenGL | Git

HONORS AND AWARDS

- **First Prize in the Chinese Mathematics Competition.** Sep. 2018
Chinese Mathematical Society, CMS 
 - One of the most influential college math competitions for university students in China.
 - Gave me a solid knowledge of advanced math, linear algebra, etc.
- **Second Prize in Tianjin City University Students Mathematics Competition** Mar. 2018
Tianjin Mathematical Society, TMS 
 - The most influential college math competitions for university students in Tianjin.
 - Gave me a solid knowledge of advanced math, linear algebra, etc.
- **Honorable Mention in Mathematical Contest in Modeling** Feb. 2020
Consortium for Mathematics and its Applications, COMAP 
 - One of the most influential mathematical modeling competitions around the world.
 - Learning how to synthesize knowledge of coding and math, etc. to solve open problems.
- **Third-class Scholarship in Tianjin University** Sep. 2018, 2019
Tianjin University 
 - To reward students who rank at the top of their class.
- **Scholarship for academic achievement** Sep. 2023
Zhejiang University 
 - To recognize and reward students who excel in research.

ADDITIONAL INFORMATION

Services: IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI) reviewer

Teaching: Applied Optics 2022 Summer, ZJU, TA

Languages: Chinese (native) | English (fluent)

Interests: Coding | Basketball | Reading | ...

REFERENCES

1. **Prof. Tianfan Xue**
Vice Chancellor Assistant Professor, Information Engineering
The Chinese University of Hong Kong
Email: tfxue@ie.cuhk.edu.hk
Relationship: Project Supervisor
2. **Prof. Jinwei Gu**
Principle Research Scientist | Adjunct Associate Professor
NVIDIA Research | The Chinese University of Hong Kong
Email: jinweig@nvidia.com | jwgu@cuhk.edu.hk
Relationship: Project Supervisor
3. **Dr. Shi Guo**
Young Researcher, SAIL
Shanghai AI Laboratory
Email: guoshi@pjlab.org.cn
Relationship: Project Supervisor