

# 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.
- [C.3] Liqun Chen, Yuxuan Li, Jun Dai, Jinwei Gu, Tianfan Xue (2024). **A Physics-Informed Blur Learning Framework for Imaging Systems**. *Conference on Computer Vision and Pattern Recognition*, 2025.
- [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 *International Conference of Computational Photography*, 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

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

## HONORS AND AWARDS

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- **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

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**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

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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*