



YUYAO HUANG

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I am now a Ph.D student at Department of Electronic Engineering, Tsinghua University, advised by [Professor Hongwei Chen](#). I received M.S from Shanghai Jiao Tong University in 2020, co-advised by [Professor Zuyuan He](#) and [Professor Wenjia Zhang](#). Before coming to SJTU, I graduated from Sichuan University with B.S degree in 2017. I joined Advanced Optical Technology Laboratory, Huawei Technologies in 2020-2021 as a Senior Research Engineer.

My work bridges high performance computing and photonics. Conventional electronic computer is facing challenges in computational bandwidth and power consumption when processing AI applications, due to the adopted Von Neumann architecture. My current research addresses this issue by accelerating neuromorphic computation with [optical signal processing](#) and [silicon photonics](#) technologies, including on-chip optical diffractive tensor core with metasurfaces, optical neural network with time-wavelength interleaving and implicit representation on photonic devices and systems.

EDUCATION

Doctor of Philosophy | *Electronic Engineering*

Department of Electronic Engineering, Tsinghua University

Sep. 2021 – Present

Beijing, China

Master of Science | *Electronic Engineering*

Department of Electronic Engineering, Shanghai Jiao Tong University

Sep. 2017 – Jun. 2020

Shanghai, China

Bachelor of Science | *Electronic Engineering*

School of Electronic Engineering, Sichuan University

Sep. 2013 – Jun. 2017

Chengdu, China

WORK EXPERIENCE

Senior Research Engineer

Advanced Optical Technology Laboratory, Huawei Technologies Co., Ltd.

June 2020 – Jun 2021

Shenzhen, Guangdong

- Worked in silicon photonics engine research for data center and access networks
- Employed deep learning technologies for design and optimization of silicon photonics devices
- Developed optoelectronic packaging technologies for silicon photonics system

RESEARCH INTEREST

Deep learning

Study on advanced algorithms for a more powerful AI, including:

- Sophisticated machine visions and computational imaging
- Fine-tune algorithms for large language model
- Physical-aware intelligence

Silicon Photonics

Study on highly efficient integrated photonics for communication, switching and computing, including:

- Passive photonic devices and systems
- High speed optoelectronic devices and systems
- Microwave photonics architecture

Neuromorphic photonics

Study on large-scale neuromorphic photonic computing with high bandwidth and energy efficiency, including:

- Optical neural networks with time-wavelength interleaving
- On-chip reconfigurable diffractive processing unit for massive tensor processing
- Physical-aware intelligence

HONORS AND AWARDS

Excellent Master's Dissertation of Chinese Institute of Electronics	Jun. 2020
One of the 28 selected Master dissertations in electronic engineering field national wide	
Outstanding Graduates of Shanghai Jiao Tong University	Jun. 2020
Recognition to top 5% of all graduated students of SJTU	
Outstanding Student of Center for Intelligent Photonics, SJTU	May. 2020
The only award-winning master's student of CIP	
National Scholarship	Oct. 2019
Recognition to top 1% of all graduate students national wide	
First-Class Scholarship of Shanghai Jiao Tong University	Sep. 2017 - Jun. 2020
Recognition to graduate students with excellent researches in their respective fields	
Special Scholarship of Sichuan University	May. 2014 - Jun. 2016
Recognition to undergraduate students with excellent GPA ranking	

PUBLICATIONS

1. Yuyao Huang, Tingzhao Fu, Honghao Huang, Sigang Yang, and Hongwei Chen. Sophisticated deep learning with on-chip optical diffractive tensor processing. *Photonics Research*, 11(6):1125–1138, 2023
2. Tingzhao Fu, Yubin Zang, Yuyao Huang, Zhenmin Du, Honghao Huang, Chengyang Hu, Minghua Chen, Sigang Yang, and Hongwei Chen. Photonic machine learning with on-chip diffractive optics. *Nature Communications*, 14(1):70, 2023
3. Wencan Liu, Tingzhao Fu, Yuyao Huang, Run Sun, Sigang Yang, and Hongwei Chen. C-donn: compact diffractive optical neural network with deep learning regression. *Optics Express*, 31(13):22127–22143, 2023
4. Yuyao Huang, Wenjia Zhang, Fan Yang, Jiangbing Du, and Zuyuan He. Programmable matrix operation with reconfigurable time-wavelength plane manipulation and dispersed time delay. *Optics express*, 27(15):20456–20467, 2019
5. Yuyao Huang, Wenjia Zhang, Fan Yang, and Zuyuan He. Optical matrix manipulation based on frequency comb modulation and dispersed time delay. In *Optical Fiber Communication Conference*, pages M1B–4. Optica Publishing Group, 2019

SKILLS

Languages: Mandarin (Native), English (Advanced)

Software: Python, Matlab, LaTeX, Lumerical, Tensorflow, Keras, Klayout, OriginLab, Microsoft Office