Zhijie Liu

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EDUCATION

Huazhong University of Science & Technology, Wuhan, China   June 2024

BS in Opto-electronic Information Science and Engineering

Awards: Outstanding Communist Youth League member

*   Honorable Mention in Mathematical Contest in Modeling*

GPA: 3.16/4.0, TOEFL: 93

RECEARCH EXPERIENCE

Unpaired adversarial learning improves the effect of optical chromatography   09/2023-now

- *Description*: An unpaired learning algorithm (**UTAN**) is developed, which converts unpaired images into paired images and completes training with adversarial learning. This algorithm only uses two completely different images as training contrast images to complete the chromatography, which solves the problem that it is difficult to get completely matched images in practice.
- *Meaning*: This work further improves the signal-to-back ratio of chromatographic images, the noise level is much less than that of structured light imaging (SIM), and the signal-to-back ratio exceeds the traditional optical tomography system. Moreover, it has many typical applications, such as the realization of DAPI dyeing optical chromatography, and the unity of imaging quality of different types of samples.
- *Accomplishment*: Still preparing the manuscript.

Mouse Glomerular Medical Image Recognition Based on U-net Neural Network   02/2023-09/2023

- *Description*: A neural network was established based on U-net with several artificially marked mouse kidney segmentation images as a test set. The mouse glomeruli and renal capillaries were identified by deep learning algorithm to calculate their volumes, so as to better study the mechanism of renal lesions.
- *Tools*: ImageJ, Python, Pytorch, and MATLAB.
- *Accomplishment*: a paper being delivered.

Metalens-based rotating zoom lens set   06/2023-now

- *Description*: In this project, I designed a three-lens rotating zoom system based on metasurface, which can realize the functions of rotating lens to change the focal length and fix the focal plane, and can be integrated into a small camera to improve the imaging effect.
- *Tools*: Lumerical FDTD solutions, MATLAB, Zmax.
- *Accomplishments*: Still preparing the manuscript.

Optical Multi-parameter Detection Based on Dielectric Metalens array   09/2022-02/2023

- *Description*: The most important work was to construct a new evaluation function, which iterated to obtain the maximum overall transmittance and the optimal phase bias of the metalens sizes design, so that the lens can realize the function of being sensitive to polarized light in a specific direction.
- *Tools*: skills of Hartmann-shack wavefront detection, PB phase modulation, and Stokes parameter, used FDTD solutions, MATLAB and Python.
- *Accomplishment*: A research report and a presentation finished.

OTHER EXPERIENCE

Online Machine Learning Courses on Coursera   11/2022-04/2023

- Supervised Machine Learning: Regression and Classification, Stanford
- Advanced Learning Algorithms, Stanford
- Unsupervised Learning, Recommenders, Reinforcement Learning, Stanford

Hands-on Projects, Engineering Training Center   03/2022-07/2022

- **PCB Design and Machining**
  Used Altium Designer software to design the circuit diagram, operated the machine to process the PCB circuit board and then soldered the wires and other electronic components to make a Bluetooth speaker.
- **3D Printing**
  Designed the print models with Free CAD and print the finished products using a 3D printing machine.
- **Laser Processing**
  Designed patterns, learned the production process, operated laser processing machines, and made products.

Internship at SAP, remote   03/2023

- Program name: Cybersecurity Engineering Virtual Internship Program
- Tasks: learn practical skills about password management, industry analysis and principles of defense; identify and mitigate phishing attempts by learning industry standards, anti-phishing tactics and techniques and impact analysis; Windows hardening techniques; write a report about analysis and recommendations.

Club Activity & School Sports Team

- Core member of the school **host team**   09/2020-06/2023
  presided over the class style show of the college, the school-level debate competitions, and shared the lecture themed "Stage hosting and defense Skills" as the keynote speaker in 100 navigation series lectures
- Member of the school **dragon boat team**   09/2020-04/2021

Volunteer Work

- **School hospital volunteer**
  Dredge the flow of people when the new students enter the school physical examination, guide the patients to the designated place, assist the doctor to complete the queuing physical examination and issue the physical examination list
- **Environmental voluntee**r
  Go to the student dormitory to collect old clothes to donate to poor areas, collect old books to give to poor freshmen, collect recyclable garbage and publicize environmental protection knowledge to enhance students' environmental awareness

SKILLS AND INTERESTS

- *Computer Skills:* Python, MATLAB, FDTD, Zmax.
- *Language Skills:* Chinese(native), English(proficient), Korean(intermediate).
- *Interests:* painting, baking, skiing, singing.