

KAIWEN LI

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EDUCATION

University of Electronic Science and Technology of China

Sep 2021 - Present

M.S. in Electronic Science and Technology, GPA: 3.89/4.00, rank: 3/146

China University of Petroleum

Sep 2016 - Jun 2021

B.S. in Electronic Information Engineering, GPA: 3.95/4.00, rank: 1/86

PUBLICATIONS

- Comprehensive Assessment of Anterior Segment in Refraction Corrected OCT Based on Multitask Learning.
Kaiwen Li, Guangqian Yang, Shuimiao Chang, Jinhan Yao, Chong He, Fang Lu, Xiaogang Wang, Zhao Wang. *Biomedical Optics Express*, 14(8), 3968-3987(2023).
- Multi-Dimensional Convolution and Transformer for Predicting the Frequencies of Drug Side Effects.
Kaiwen Li, Chunchun Wang, Li Zhang, Xing Chen. *Briefings in Bioinformatics* (Under review).
- Automatic measurement of anterior chamber angle parameters in AS-OCT images using deep learning.
Guangqian Yang, **Kaiwen Li**, Jinhan Yao, Shuimiao Chang, Chong He, Fang Lu, Xiaogang Wang, Zhao Wang. *Biomedical Optics Express*, 14(4), 1378-1392(2023).
- Comprehensive Assessment of Coronary Calcification in Intravascular OCT Using a Spatial-Temporal Encoder-Decoder Network.
Chao Li, Haibo Jia, Jinwei Tian, Chong He, Fang Lu, **Kaiwen Li**, Yubin Gong, Sining Hu, Bo Yu, Zhao Wang. *IEEE TRANSACTIONS ON MEDICAL IMAGING*, 41(4), 857-868(2021).
- NSCGRN: a network structure control method for gene regulatory network inference.
Wei Liu, Xingen Sun, Li Yang, **Kaiwen Li**, Yu Yang, Xiangzheng Fu. *Briefings in Bioinformatics*, 23(5), 2022.
- Coronary artery calcification and cardiovascular outcome as assessed by intravascular OCT and artificial intelligence.
Jinwei Tian, Chao Li, Zhifeng Qin, Yanwen Zhang, Qinglu Xu, Yuqi Zheng, Xiangyu Meng, Peng Zhao, **Kaiwen Li**, Suhong Zhao, Shan Zhong, Xinyu Hou, Xiang Peng, Yuxin Yang, Yu Liu, Songzhi Wu, Yidan Wang, Xiangwen Xi, Yanan Tian, Wenbo Qu, Na Sun, Fan Wang, Yan Wang, Jie Xiong, Xiaofang Ban, Taishi Yonetsu, Rocco Vergallo, Bo Zhang, Bo Yu, Zhao Wang. *Medical Image Analysis* (Under review).

RESEARCH EXPERIENCE

University of Electronic Science and Technology of China, Biomedical Imaging and Vision Lab *Jul 2021 - Present*

Research Assistant, Lab Manager, Advisor: Prof. Zhao Wang

Analysis of Anterior segment-OCT(AS-OCT) images based on Multitask learning, Project Manager

- Proposed the first multitask deep learning method for simultaneous segmentation and landmark detection in AS-OCT images, whose performance is comparable to advanced physicians.
- Designed an automatic method to perform refraction correction for accurate quantification in AS-OCT images.
- Implemented automatic assessment of anterior segment by measuring comprehensive clinical parameters for diagnosis, surgery planning, and post-surgery assessment.

Segmentation of cholesterol crystals in Intravascular OCT, Project Manager

- Designed the data collection and annotation pipeline, collaborating with cardiovascular physicians.
- Implemented a diffusion model-based method for high-resolution interpolation in intravascular OCT images.
- Working on developing a segmentation method for cholesterol crystals which are small targets.

Robot-assisted wide-field OCT system, Project Manager

- Designed and built an OCT system to achieve ~10 cm ranging distance and a large imaging field of view. Mounted the sample arm of the OCT system on a 6-axis robotic arm to perform automatic scanning of large objects.
- Developed the software for system control, data acquisition, and preview image generation in C++ and CUDA.

- Demonstrated system performance for in vivo imaging of entire human faces and generated human face point cloud for accurate surface reconstruction.

OCT systems for small animals

- Developed the software for system control, data acquisition, and preview image generation for our SSOCT and SDOCT systems. Implemented real-time image processing by using NVIDIA GPU and Cuda programming.
- Designed and built the data acquisition system in our SDOCT system, achieving a lateral resolution of 3.9 μm .
- Conducted ex vivo imaging of mouse colon and porcine coronary arteries as well as in vivo imaging of human fingerprints, human retina, and mouse retina.

Multimodal endomicroscopy system based on OCT and fluorescence imaging

- Designed and built the control systems and data acquisition systems for OCT and fluorescence imaging. Participated in the design and build of optical systems.
- Developed the software for system control, data acquisition, and image generation. Implemented the control of rotary junction and the master/slave communication to perform intravascular imaging.

Assessment of Coronary Calcification in Intravascular OCT

- Participated in the construction of a large intravascular OCT image database with millions of images and the design of segmentation workflow.
- Conducted experiments for comparison with other state-of-the-art methods.

Jiangnan University, Institute of Bioinformatics

Apr 2020 - Present

Visiting student researcher, Advisor: Prof. Xing Chen

Prediction of the frequencies of drug side effects, Project Manager

- Proposed a new deep-learning network for predicting the frequencies of drug side effects by using similarity information and drug molecular structure features, achieving state-of-the-art results.
- Designed a framework for case study by performing association prediction followed by frequency prediction of drug side effects for real-world applications.
- Mentored undergraduates on drug discovery projects.

SELECTED SCHOLARSHIPS AND AWARDS

The First Prize Scholarship , University of Electronic Science and Technology of China	<i>2022</i>
Received for achieving high academic excellence in the first year of a Master's degree.	
Pacemaker to Outstanding Student , China University of Petroleum	<i>2021</i>
The top award in China University of Petroleum, awarded to 10 students from all students of 2021.	
National Scholarship , Ministry of Education of China	<i>2020</i>
Received for achieving the highest distinction and recognition for junior academic work.	
National Scholarship , Ministry of Education of China	<i>2019</i>
Received for achieving the highest distinction and recognition for sophomore academic work.	
Provincial Outstanding Student Award , Shandong Provincial Government	<i>2018</i>
Awarded for exceptional academic achievement.	
National Scholarship , Ministry of Education of China	<i>2018</i>
Received for achieving the highest distinction and recognition for freshman academic work.	

TEACHING EXPERIENCE

Biomedical Optics, University of Electronic Science and Technology of China

Winter 2021

Teaching Assistant

TECHNICAL SKILLS

Programming Languages: Python, Matlab, C++, C, CUDA, PyTorch

Design and Prototyping: Altium Designer, Solidworks

Embedded system: STM32, Arduino, MSP430