Yunhui Jiang

No. 166 Ren'ai Road, Huqiu District, Suzhou, China

Tel: +86 15177350527 | Email: jiang_yunhui99@163.com | Web: https://yunhui-jiang.github.io/

Research Interests

- Photoacoustic-ultrasound dual-modality imaging and system integration
- Programmable and flexible laser-induced ultrasound sources based on optical absorption structures
- Focused ultrasound for non-invasive biomedical applications

Education

ShanghaiTech University Shanghai, China
M.Sc. in Electronic Science and Technology *Sept. 2022 – June 2025*
- GPA: 3.48/4.0
- Supervisor: Prof. Fei Gao, Prof. Xiran Cai

Xi'an University of Posts and Telecommunications Xi'an, China
B.S. in Optoelectronic Information Science and Engineering *Sept. 2017 – June 2021*
- GPA: 3.41/4.0 (Average Score: 85.59/100, Rank: 3/256)
- Thesis: High-Temperature Storage Characteristics of Ga_2O_3 with Ti/Al/Pt/Au Multilayer Ohmic Contacts

Working Papers

1. **Yunhui Jiang**, Fan Zhang, Yuwei Zheng, Ruixi Sun, Xiran Cai*, and Fei Gao*, "Disposable Opto-Acoustic Window Enabled Plug-and-Play Photoacoustic-Ultrasound Dual-modal Imaging", **Optics Letters**(2025) [PDF]
2. Sheng Liao, Ruixi Sun, ***Yunhui Jiang***, Fan Zhang, Youshen Xiao, Yuwei Zheng, Hengrong Lan, Fei Gao*, "Photoacoustic tomography of human eye and oxygenation quantification: a feasibility study", **Optics Letters**(2025) **Under Review**

Research Experience

1. **Programmable Laser-Induced Ultrasound Design and Simulation via k-Wave**
   Principal Investigator, Ongoing *July 2025 – Present*
   - Designed spatially patterned optical absorbers capable of generating laser-induced ultrasound fields with tunable directionality and amplitude under pulsed laser excitation
   - Applied phased-array principles by encoding spatial phase delays through absorber geometry, enabling programmable beam steering and dynamic acoustic focusing
   - Built a k-Wave simulation framework to model ultrasound propagation and evaluate focusing performance in water and heterogeneous tissue-mimicking media
   - Analyzing resolution and energy distribution across different pattern configurations to inform the practical design of flexible acoustic focusing patches

2. **Dual-modality Photoacoustic-Ultrasound Imaging Using Laser-Induced Ultrasound from Black Tape**
   *Principal Investigator, Published in **Optics Letters*** *July 2024 – June 2025*
   - Designed a plug-and-play opto-acoustic window enabling coaxial photoacoustic and ultrasound imaging triggered by a single laser pulse
   - Streamlined fabrication process using black PVC tape for high reproducibility and low cost
   - Validated signal stability and dual-modality imaging performance through extensive phantom experiments and in vivo finger imaging studies

3. **Noninvasive Intracranial Pressure Monitoring via Transcranial Photoacoustic Imaging**
   Co-Investigator, Completed Project *Sept. 2024 – Dec. 2024*
   - Developed a photoacoustic imaging platform integrating a tunable NIR laser, linear-array ultrasound probe, high-speed DAQ, and a stabilized transcranial probe mount
   - Conducted in vivo transcranial photoacoustic imaging experiments on human volunteers, synchronized with invasive ICP monitoring for ground-truth validation
   - Reconstructed vascular structures using delay-and-sum beamforming and geometric correction; implemented multi-wavelength spectral unmixing for quantitative $\mathrm{HbO_2}$/HbR mapping
   - Developed a linear regression model correlating photoacoustic-derived $\mathrm{sO_2}$ with measured ICP, demonstrating a strong inverse relationship
4. **Speckle Imaging through Scattering Layers**
   Primary contributor, Course: Biomedical Photonics and Imaging *Dec. 2024 – Jan. 2025*
   - Reproduced speckle imaging methods using memory effect for optical reconstruction
   - Evaluated and extended methods for high-resolution, wide-FoV imaging, validating their performance in dynamic and complex scattering environments
5. **3D Digital Eye Phantom for Functional Photoacoustic Imaging and $\mathrm{sO_2}$ Quantification**
   Co-author, Under Review *Sept. 2024 – Mar. 2025*
   - Performed pixel-wise quantification of retinal $\mathrm{sO_2}$ using linear spectral unmixing
6. **Self-developed DAQ Debugging and Photoacoustic Data Acquisition**
   Principal Investigator, Completed and in active use *Sept. 2023 – June 2024*
   - Debugged hardware and software of a self-developed DAQ card to resolve signal acquisition issues
   - Integrated the DAQ card into the imaging system and conducted phantom and in vivo experiments
   - Verified signal stability and imaging quality for real-time photoacoustic acquisition
7. **Mini Review: Algorithms for Photonic Spiking Neural Networks**
   Course-based Research Project under Prof. Cheng Wang, Course: Optical Computing and Optical Neural Networks *Sept. 2022 – Jan. 2023*
   - Reviewed spiking neuron models in biology and photonics for neuromorphic computing frameworks
   - Analyzed encoding schemes and photonic STDP implementations using SOA and EAM
   - Assessed optical SNN for all-optical systems and proposed improvements for spike-based supervised learning

Awards and Honours

Outstanding Graduate of ShanghaiTech University	*2025*
National Graduate Academic Scholarship	*2022, 2023, 2024*
University-Level Graduate Scholarship	*2022, 2023, 2024*
Outstanding Graduate of Shaanxi Province	*2021*
National Encouragement Scholarship	*2019, 2020*
Shanghai Way-on Semiconductor Co., Ltd. Scholarship	*2019*

Skills

Programming Language: Matlab, Python, LaTeX

Professional software: Solidworks, Comsol, Auto-CAD, Origin, 3ds Max, KeyShot

Languages: Mandarin (Native), English (Fluent)