Yunhui Jiang

References: Prof. Fei Gao, Prof. Xiran Cai

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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
- Thesis: Research on photoacoustic ultrasound dual-modal imaging system based on low-cost opto-acoustic window

Xi'an University of Posts and Telecommunications (XUPT) Xi'an, China
B.Sc. in Optoelectronic Information Science and Engineering *Sept. 2017 – June 2021*

- GPA: 3.41/4.0 (Average Score: 85.58/100, Rank: 3/229)
- 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**
3. Kaili Ren, Minhui Cheng, Liyong Ren, ***Yunhui Jiang***, Dongdong Han, Yongkai Wang, Jun Dong, Jihong Liu*, Li Yang*, and Zhanqiang Xi*, "Ultra-broadband conversion of OAM mode near the dispersion turning point in helical fiber gratings", ***OSA Continuum*** (2020) [PDF]
4. Youshen Xiao, Zhengyuan Zhang, Ruixi Sun, Yiling Shi, Sheng Liao, Fan Zhang, ***Yunhui Jiang***, Xiyu Chen, Arunima Sharma, Manojit Pramanik, Yuyao Zhang*, Fei Gao*, "Resolution Enhancement of Under-sampled Photoacoustic Microscopy Images using Neural Representation", ***IEEE Transactions on Computational Imaging*** (2025) [PDF]

Research Experience

1. **Design and Simulation of a Flexible Laser-Induced Ultrasound Patch**
   Principal Investigator, Ongoing *July 2025 – Present*
   - Proposed a biocompatible and skin-conformal ultrasound patch concept patterned optical absorbers on flexible substrates for non-invasive neuromodulation
   - Applied phased-array principles by encoding spatial phase delays through absorber geometry, enabling programmable beam steering and dynamic acoustic focusing
   - Established a k-Wave simulation framework to generate laser-induced ultrasound and visualize acoustic pressure fields in heterogeneous tissue models
   - Performed parametric optimization of absorber patterns to balance spatial resolution, acoustic safety, and energy distribution, providing design guidelines for future minimally invasive devices
2. **Development of a Plug-and-Play Dual-Modal Photoacoustic–Ultrasound Imaging System**
   *Lead developer, Published in **Optics Letters*** *July 2024 – June 2025*
   - Designed a compact plug-and-play opto-acoustic window enabling coaxial photoacoustic and ultrasound imaging triggered by a single laser pulse

- Developed a reproducible fabrication process using cost-effective absorber films, enabling robust and scalable device manufacturing
- Integrated a custom high-speed DAQ for stable real-time signal acquisition and delay-and-sum reconstruction
- Demonstrated *ex vivo* and *in vivo* validation, achieving imaging resolutions of ∼215 μm (PA) and ∼91 μm (US) with peak SNRs of 37.5 dB (PA) and 29.8 dB (US)

3. **Noninvasive Intracranial Pressure (ICP) Monitoring via Transcranial Photoacoustic Imaging**
   Co-Investigator, Completed Project *Aug. 2024 – Feb. 2025*

   - Developed a customized photoacoustic imaging platform integrating a tunable near infrared laser, linear-array ultrasound probe, high-speed DAQ and a stabilized transcranial probe mount
   - Performed *in vivo* imaging on human volunteers in collaboration with clinicians, synchronizing photoacoustic signals with invasive ICP monitoring for gold-standard validation
   - Implemented data analysis pipeline to extract blood oxygenation metrics from reconstructed images
   - Built a linear regression model to correlate photoacoustic-derived sO_2 with measured ICP, demonstrating a strong inverse relationship

4. **Fabrication and Characterization of Ga_2O_3-based Thin-Film Devices**
   Undergraduate Thesis Project, School of Optoelectronic Engineering, XUPT *Dec. 2020 – June 2021*

   - Deposited ∼180 nm Ga_2O_3 thin films on Si/SiO_2 substrates via RF magnetron sputtering and improved crystallinity through 950 °C annealing
   - Executed a cleanroom process flow including photolithography with AZ5214 resist, e-beam evaporation of Ti/Al/Pt /Au electrodes and lift-off process to define circular transmission-line model (CTLM) patterns
   - Performed high-temperature annealing, rapid thermal annealing and long-term thermal storage tests to study ohmic contact formation and interface reliability
   - Characterized film structure and device performance using XRD, SEM, UV–Vis, Raman spectroscopy and I–V measurements to establish structure–property relationships
   - Extracted specific contact resistivity by linear regression of CTLM data and analyzed process-induced variations
   - Identified key process limitations such as film porosity and incomplete lift-off and proposed process optimizations including improved sputtering parameters and ultrasonic-assisted lift-off

Awards and Honours

Outstanding Graduate of ShanghaiTech University (Top 10% of Graduates University-wide)	*2025*
Outstanding Teaching Assistant (Top 10%)	*2025*
National Graduate Academic Scholarship	*2022, 2023, 2024*
University-Level Graduate Scholarship	*2022, 2023, 2024*
Outstanding Graduate of Shaanxi Province (Top 1% of Graduates University-wide)	*2021*
National Encouragement Scholarship (Awarded to 5 students in the major)	*2019, 2020*
Outstanding Student Leader (Top 1% of the class)	*2019*
Shanghai Way-on Semiconductor Co., Ltd. Scholarship	*2019*

Skills

Programming Language: Matlab, Python, LaTeX, Markdown

Professional software: k-Wave, Solidworks, Comsol Multiphysics, Auto-CAD, Origin

Experimental Skills: RF magnetron sputtering, Photolithography, E-beam evaporation, Lift-off, Thermal annealing

Languages: Mandarin (Native), English (Fluent), French (Experienced)