Mengjie Shi

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Research Interests

My research interest lies in high-performance and translational imaging techniques based on acoustics and optics, aiming for structural and functional imaging of human body including brain and surgical guidance.

Education

Postdoc in Blood Flow Imaging in Human Brain   *London, UK*
IMPERIAL COLLEGE LONDON   *2024 - 2027*
- Advisors: Prof. Tang Mengxing

PhD in Biophotonics   *London, UK*
KING'S COLLEGE LONDON   *2020 - 2024*
- Thesis: Image enhancement and quantification in photoacoustic tomography with light-emitting-diode illumination
- Advisors: Dr. Wenfeng Xia and Prof. Tom Vercauteren

MS in Communications and Signal Processing   *London, UK*
IMPERIAL COLLEGE LONDON   *2019 - 2020*
- Graduated with Distinction
- Thesis: Fire detection using 360-degree images and deep learning techniques
- Advisor: Dr. Panagiota (Tania) Stathaki

BS in Optoelectronic Information Science and Engineering   *Nanjing, China*
NANJING UNIVERSITY OF SCIENCE AND TECHNOLOGY   *2015 - 2019*
- Overall GPA: 3.78/4
- Thesis: Intelligent weld joint recognition using structured light illumination and photoelectric tracking
- Honors thesis/undergrad research advisor: Dr. Yang Song

Publications

JOURNAL PAPERS

Shi, M., Yao, T., Vercauteren T., & Xia, W. (2025) Data-driven Needle Tip Tracking with A Photoacoustic Beacon for Ultrasound-Guided Minimally Invasive Procedures. Under Review.

Shi, M., Vercauteren, T., & Xia, W. (2024). Learning-based sound speed estimation and aberration correction for linear-array photoacoustic imaging. Photoacoustics, 100621.

Shi, M., West, S. J., Vercauteren, T., Noimark, S., Desjardins, A. E., & Xia, W. (2024). Photoacoustic Imaging of Interventional Devices for Guiding Minimally Invasive Medical Procedures. Biomedical Photoacoustics: Technology and Applications, 547-571.

Shi, M., Vercauteren, T., & Xia, W. (2022). Spatiotemporal singular value decomposition for denoising in photoacoustic imaging with a low-energy excitation light source. Biomedical Optics Express, 13(12), 6416-6430.

Shi, M., Bodian, S., West, S. J., Sathasivam, S., Gordon, R. J., Collier, P., ... & Xia, W. (2022). Enhanced Photoacoustic Visualisation of Clinical Needles by Combining Interstitial and Extracorporeal Illumination of Elastomeric Nanocomposite Coatings. Sensors, 22(17), 6417.

Shi, M., Zhao, T., West, S. J., Desjardins, A. E., Vercauteren, T., & Xia, W. (2022). Improving needle visibility in LED-based photoacoustic imaging using deep learning with semi-synthetic datasets. Photoacoustics, 26, 100351.

CONFERENCE PROCEEDINGS ** equal contribution*

Shi, M., Vercauteren, T., & Xia, W. (2024, September). A deep learning framework for light propagation modelling for quantitative photoacoustics. In 2024 IEEE Ultrasonics, Ferroelectrics, and Frequency Control Joint Symposium (UFFC-JS) (pp. 1-4). IEEE.

Shi, M., Vercauteren, T., & Xia, W. (2024, March). Learning to compensate spectral coloring in a LED-based photoacoustic/ultrasound imaging system. In Photons Plus Ultrasound: Imaging and Sensing 2024 (Vol. 12842, pp. 69-72). SPIE.

Zhao, T.*, **Shi, M.***, Ourselin, S., Vercauteren, T., & Xia, W. (2023, March). Deep learning boosts the imaging speed of photoacoustic endomicroscopy. In Photons Plus Ultrasound: Imaging and Sensing 2023 (Vol. 12379, pp. 102-106). SPIE.

Zhao, T.*, **Shi, M.***, Ourselin, S., Vercauteren, T., & Xia, W. (2022, March). AI-enabled high-speed photoacoustic endomicroscopy through a multimode fibre. In Photons Plus Ultrasound: Imaging and Sensing 2022 (Vol. 11960, pp. 138-143). SPIE.

Selected Conference Presentations

A deep learning framework for light propagation modelling for quantitative photoacoustics. Oral presentation at IEEE International Ultrasonic Symposium (IUS) 2024, Taipei, Taiwan. Sep 2024.

Learning to compensate spectral coloring in a LED-based photoacoustic/ultrasound imaging system. Oral presentation at SPIE Photons Plus Ultrasound: Imaging and Sensing 2024, San Francisco, US. Feb 2024.

Deep learning boosts the imaging speed of photoacoustic endomicroscopy. Oral presentation at SPIE Photons Plus Ultrasound: Imaging and Sensing 2023, San Francisco, US. Feb 2023.

Photoacoustic imaging denoising using spatiotemporal singular value decomposition: a study with a LED-based system. Oral presentation at BioMedEng22, Univeristy College London, London, UK. Sep 2022.

Noise reduction in photoacoustic imaging with low-energy light sources. Invited talk at 44th International Engineering in Medicine and Biology Conference (EMBC), Glasgow, Scotland, UK. July 2022.

Improving photoacoustic imaging of clinical needles using candle soot nanocomposite coatings. Oral presentation at Optics + Ultrasound V, Institude of Physics, London, UK. Sep 2022.

Enhancing photoacoustic visualisation of clinical needles with deep learning. Oral presentation at IEEE International Ultrasonics Symposium 2021, Online. Sep 2021.

Awarded Grants

IEEE UFFC-JS Student Travel Grant (£1000), IEEE, 2024

Henry Lester Trust Grant (£1500), Henry Lester Trust, 2024

Postgraduate Student Activity Grant (£150), Faculty of Life Sciences and Medicine, King's College London, 2024

IPASC Research Activity Grant (£2000), International Photoacoustic Standardization Consortium (IPASC), 2024

Postgraduate Conference Travel Grant (£800), Faculty of Life Sciences and Medicine, King's College London, 2022

Mentoring

Tianliang Yao, Undergraduate Projects, Tongji University, China.

Jeref Merlin, Carlo Saija, Postgraduate Summer School, King's College London, UK.

Jamie Krens M.D., Scholarly Module Project, King's College London, UK.

Jiawei Zhu, Zikang Song, Postgraduate Individual Projects, King's College London, UK.

Outreach & Professional Development

Review Editor for Biophotonics (Speciality Section of Frontiers in Photonics)

Leadership Team of Data Management Theme in International Photoacoustic Standardization Consortium (IPASC)