Jing Yang

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Education

ShanghaiTech University — Sept 2019 - Sept 2023
B.Eng. in Biomedical Engineering, [Jun, 2023]; GPA: 3.49/4.0; Rank: 25% — Shanghai, China

- Coursework: Probability and Statistic (A-), Signals and Systems (A-), Medical Imaging (A), Digital Integrated Circuits I (A), Medical Image Processing and Analysis (A+).

University of Chinese Academy of Sciences — Sept 2023 - Present
M.Eng. in Biomedical Engineering, [Expected: Jun, 2026]; GPA: 3.87/4.0 — Shenzhen, China

- Coursework: Machine Learning, Deep Learning, Medical Image Analysis.

Research Interests

- Ultrasound Imaging: Ultrasound Localization Microscopy (ULM), Transcranial Ultrasound Imaging, 3D Ultrasound
- Machine Learning: Deep Learning
- Image Analysis: Image Reconstruction, Image Registration, Sound Speed Mapping

Publications

- High-Precision Wavefield Simulation and Deep Learning-Based Sound Speed Reconstruction for Transcranial Ultrasound Imaging
  Jing Yang, Yue Pan, Yu Qiang, Xingying Wang, Zhiqiang Zhang, Yanyan Yu, Hairong Zheng, Weibao Qiu
  Submitted to Ultrasonics, Under Revision
- Deep Learning-Based Skull Sound Speed Reconstruction for Phase Correction in Transcranial Ultrasound Localization Microscopy
  Jing Yang, Yue Pan, Yu Qiang, Weibao Qiu
  Accepted by the IEEE International Ultrasonics Symposium (IUS) 2025 [Oral]
- A Skull Sound Speed Estimation method based on Deep Learning for Phase Correction
  Jing Yang, Yue Pan, Yu Qiang, Weibao Qiu
  Accepted by 16th International Conference on Ultrasound Engineering for Biomedical Applications (IC-UEBA 2025)
- Physical Parameter-Guided Deep Learning Framework Based on Diffusion Model for Ultrasound Localization Microscopy
  Yu Qiang, Jing Yang, Wenjie Liang, Wenyue Huang, Zhiqiang Zhang, Weibao Qiu
  Accepted by the IEEE International Ultrasonics Symposium (IUS) 2025

Research Experience

Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences (SIAT) — Shenzhen, China
Graduate Student, Supervised by Prof. Weibao Qiu

- Deep Learning-Based Skull Sound Speed Reconstruction for Phase Correction in Transcranial Ultrasound Localization Microscopy (ULM) — Jan 2025 - Present
  Supported by the Strategic Priority Research Program (Category B), Chinese Academy of Sciences (CAS)
  - Objective: Address the critical challenge of skull-induced phase aberration in transcranial ultrasound imaging by reconstructing speed of sound (SoS) maps, enabling effective phase correction and improved image quality.
  - Established a micro-CT-based numerical simulation method to generate SoS maps and ultrasound transmission signals in porous cranial bone.
  - Developed a novel deep learning framework WAM-Net for reconstructing skull SoS from raw plane wave RF data. The model incorporates a Wavefront Attention Module to emphasize distortion-related features and a gradient-regularized loss to enforce spatial continuity. WAM-Net achieved a 28.79% reduction in SoS reconstruction error compared to SOTA, while significantly reducing computational time. In in-vivo experiments on rats and crab-eating macaques, WAM-Net accurately reconstructed skull SoS maps.
  - In phantom ULM experiments, this correction reduced vessel localization error by 81.18% compared to results without correction. In in-vivo rat ULM, phase correction improved microvascular resolution, with vessel

structures highly consistent with MRI-based MRA, confirming the method's accuracy and clinical relevance.
  - Part of the results has been submitted to Ultrasonics (Under Major Revision); additional experiments and analysis are ongoing.
- Motion Correction for Ultrasound Localization Microscopy Sept 2024 - Present
  Supported by the National Major Scientific Instrument Development Project, China
  - Objective: Develop a deep learning-based approach to correct motion artifacts in ULM caused by respiratory and cardiac activity, aiming to enhance localization accuracy and image quality during long acquisitions.
  - Applied a non-rigid registration framework inspired by VoxelMorph to estimate deformation fields across frame sequences, enabling accurate correction of microbubble trajectories in the presence of motion.
  - Validated the method on rabbit kidney ULM imaging, demonstrating significant improvements in correction accuracy over traditional methods while substantially reducing computation time. The proposed framework provides a promising foundation for real-time ULM in abdominal applications.

ShanghaiTech University Shanghai, China
Undergraduate Student, Supervised by Prof. Rui Zheng

- Rapid Calibration and 3D Reconstruction for Freehand Ultrasound Feb 2022 - Jun 2023
  - Objective: Achieve high-quality 3D ultrasound imaging by rapidly calibrating the spatial relationship between a linear array transducer and a magnetic tracking sensor, enabling accurate alignment of sequential 2D images for volumetric reconstruction.
  - Evaluated imaging performance between ultrafast and focused ultrasound modes and selected multi-angle plane wave transmission for subsequent calibration. Designed and built custom phantoms, and simultaneously acquired ultrasound data using the Verasonics system and spatial tracking data using a magnetic sensor to support accurate probe-to-tracker calibration.
  - Modeled the calibration problem as a nonlinear optimization task and applied the Levenberg–Marquardt algorithm to accurately estimate spatial transformations, enabling precise 3D image reconstruction.

Additional Experience

Science Educator, "Doctoral Classroom" Program, SIAT Sept 2024 - Sept 2025

- Delivered science outreach lectures to primary and secondary school students.

Volleyball Team Member, ShanghaiTech University & SIAT 2021 – Present

- Actively participated in campus volleyball teams and placed 2nd in the 2025 SIAT Volleyball Competition.

Host and Organizer, Student Art and Culture Events Sept 2021 – Sept 2023

- Organized and hosted various campus events, including the New Year Gala, Singing Competition, and Orchestral Concert.

Honors and Awards

- Outstanding Student, University of Chinese Academy of Sciences (2024–2025) May 2025
- Outstanding Student, ShanghaiTech University (2021–2022) Dec 2022

Miscellaneous

- Programming Languages: Python, MATLAB
- Tools: PyTorch, Git, LaTeX, Markdown
- Ultrasound Tools: Verasonics Vantage, Field II