Hongbo Chen

Ph.D., School of Information Science and Technology

University of Chinese Academy of Sciences (ShanghaiTech University), Shanghai, China

Email: chenhb063@gmail.com Homepage: https://chenhbo.github.io

Research Interests: 3D reconstruction and scene representation, AI-based medical image analysis - segmentation/detection, biomedical ultrasound imaging and diagnosis.

EDUCATION

University of Chinese Academy of Sciences (ShanghaiTech University) Shanghai, China
Ph.D. in Electrical Engineering, Advisor: Prof. Rui Zheng. *Sept. 2018 – Jan. 2025*

University of Alberta, Dept. of Radiology and Diagnostic Imaging Edmonton, Canada
Visiting doctoral researcher, Advisor: Prof. Lawrence H. Le . *Jul. 2022 – Sept. 2023*

Changchun University of Science and Technology Changchun, China
B.Sc. in Electronic Information Engineering. *Sept. 2014 – Jun. 2018*

ACADEMIC APPOINTMENTS

Alberta Health Services Edmonton, Canada
Research Assistant, Advisor: Prof. Lawrence H. Le. *Sept. 2022 – Sept. 2023*

RESEARCH

⇒ † **Equal Contribution.** * **Corresponding Author.** See Google Schorlar.

Journals

1. S. Song, Y. Chen, D. Xu, S. Ge, Y. Huang, M. Chen, J. Shi, **H. Chen***, and R. Zheng*, "Implicitcell: Resolution cell modeling of joint implicit volume reconstruction and pose refinement in 3d freehand ultrasound," *IEEE Transactions on Medical Imaging*, 2025. *Pre-print. Under Review*.
2. H. Zeng, K. Zou, Z. Chen, Y. Gao, **H. Chen**, H. Zhang, K. Zhou, M. Wang, C. Jiang, R. S. M. Goh, Y. Liu, C. Zhu, R. Zheng, and H. Fu, "Training-free image style alignment for domain shift on handheld ultrasound devices," *IEEE Transactions on Medical Imaging*, pp. 1–1, 2024.
3. **H. Chen**, L. Kumaralingam, S. Zhang, S. Song, F. Zhang, H. Zhang, T.-T. Pham, K. Punithakumar, E. H. Lou, Y. Zhang, L. H. Le, and R. Zheng, "Neural implicit surface reconstruction of freehand 3D ultrasound volume with geometric constraints," *Medical Image Analysis*, vol. 98, p. 103305, Dec. 2024.
4. **H. Chen**, L. Qian, Y. Gao, J. Zhao, Y. Tang, J. Li, L. H. Le, E. Lou, and R. Zheng, "Development of Automatic Assessment Framework for Spine Deformity Using Freehand 3-D Ultrasound Imaging System," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 71, pp. 408–422, Mar. 2024.
5. J. Li, Y. Huang, S. Song, **H. Chen**, J. Shi, D. Xu, H. Zhang, M. Chen, and R. Zheng, "Automatic Diagnosis of Carotid Atherosclerosis Using a Portable Freehand 3-D Ultrasound Imaging System," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 71, pp. 266–279, Feb. 2024.
6. S. Song, **H. Chen**, C. Li, E. Lou, L. H. Le, and R. Zheng, "Assessing Bone Quality of the Spine in Children with Scoliosis Using the Ultrasound Reflection Frequency Amplitude Index Method: A Preliminary Study," *Ultrasound in Medicine & Biology*, Feb. 2022.
7. D. Jiang†, **H. Chen**†, R. Zheng, and F. Gao, "Hand-held free-scan 3D photoacoustic tomography with global positioning system," *Journal of Applied Physics*, vol. 132, p. 074904, Aug. 2022.
8. **H. Chen**, R. Zheng, L.-Y. Qian, F.-Y. Liu, S. Song, and H.-Y. Zeng, "Improvement of 3-D Ultrasound Spine Imaging Technique Using Fast Reconstruction Algorithm," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 68, pp. 3104–3113, Oct. 2021. *Front Cover for Issue10 VOLUME 68.*

Conferences

1. **H. Chen**, Y. Gao, S. Zhang, J. Wu, Y. Ma, and R. Zheng, "RoCoSDF: Row-Column Scanned Neural Signed Distance Fields for Freehand 3D Ultrasound Imaging Shape Reconstruction," (Marrakesh, Morocco), Medical Image Computing and Computer Assisted Intervention – MICCAI 2024, Oct. 2024. *Best Paper Award (Top 1st), ORAL Presentation. Project Page: https://chenhbo.github.io/RoCoSDF/* .
2. **H. Chen**†, L. Kumaralingam†, J. Li, K. Punithakumar, L. H. Le, and R. Zheng, "Neural Implicit Representation for Three-dimensional Ultrasound Carotid Surface Reconstruction using Unsigned Distance Function," in *2023 IEEE International Ultrasonics Symposium (IUS)*, (Montreal, QC, Canada), pp. 1–3, Sept. 2023.
3. D. Jiang†, **H. Chen**†, F. Gao, R. Zheng, and F. Gao, "Hand-held 3D Photoacoustic Imaging System with GPS," in *2022 IEEE International Ultrasonics Symposium (IUS)*, (Venice Convention Center in Venice, Italy), pp. 1–4, Oct. 2022.
4. J. Alavi, **H. Chen**, K.-C. T. Nguyen, T.-G. La, L. Kumaralingam, K. Punithakumar, M. Alexiou, E. H. Lou, M. Noga, P. W. Major, and L. H. Le, "Three-dimensional Intraoral Imaging using a Portable 3D Freehand Ultrasound System: A Phantom Study," in *2023 IEEE International Ultrasonics Symposium (IUS)*, (Montreal, QC, Canada), pp. 1–4, IEEE, Sept. 2023.
5. Y. Tang, **H. Chen**, L. Qian, S. Ge, M. Zhang, and R. Zheng, "Detection of Spine Curve and Vertebral Level on Ultrasound Images Using DETR," in *2022 IEEE International Ultrasonics Symposium (IUS)*, (Venice Convention Center in Venice, Italy), pp. 1–4, Oct. 2022.
6. H. Li, **H. Chen**, W. Jing, Y. Li, and R. Zheng, "3D Ultrasound Spine Imaging with Application of Neural Radiance Field Method," in *2021 IEEE International Ultrasonics Symposium (IUS)*, pp. 1–4, Sept. 2021.
7. **H. Chen**, R. Zheng, E. Lou, and L. H. Le, "Compact and Wireless Freehand 3D Ultrasound Real-time Spine Imaging System: A pilot study," in *2020 42nd Annual International Conference of the IEEE Engineering in Medicine Biology Society (EMBC)*, pp. 2105–2108, July 2020.
8. **H. Chen**, R. Zheng, E. Lou, and D. Ta, "Imaging Spinal Curvatures of AIS Patients using 3D US Free-hand Fast Reconstruction Method," in *2019 IEEE International Ultrasonics Symposium (IUS)*, (Glasgow, Scotland, UK), pp. 1440–1443, Oct. 2019.

Patents

1. Rui Zheng, **Hongbo Chen**. Unconstrained scanning and voxel-based three-dimensional real-time spine imaging method. Chinese invention patent. ShanghaiTech University.
   Valid No.CN110969694B. Application No.201911132940.5.
2. Rui Zheng, **Hongbo Chen**. Handheld unconstrained scanning wireless three-dimensional ultrasound real-time voxel imaging system. Chinese invention patent. ShanghaiTech University.
   Valid No.CN111184535B. Application No.202010165914.9
3. Rui Zheng, **Hongbo Chen**. A method and device for determining scoliosis angle. Chinese invention patent. ShanghaiTech University & United Imaging Intelligent Technology Co., Ltd. *Under Examination No. CN114299015A. Application No.202111630004.4*
4. Rui Zheng, **Hongbo Chen**. A fixed rod bending method based on magnetic navigation positioning. Chinese invention patent. ShanghaiTech University & ZhongShan Hospital, Fudan University. *Application No.202210987837.4*

AWARDS & TEACHING & SERVICES

► ***Awards***

- Best Paper Awardee of the 27th MICCAI Conference (Top 1st), Oct. 2024.
- Merit student of ShanghaiTech University (˜5%), 2024,2022.
- Honored Front Cover for ISSUE 10 in IEEE TUFFC (12 issues / year), Oct. 2021.
- National award for The "NXP Cup" Intelligent Car Competition (˜5%), Aug. 2017.
- National Training Program of Innovation and Entrepreneurship for Undergraduates (Host, 2700$), 2015-2017.

► ***Teaching Assistants***

- SI200, Academic Paper Writing, 2021 Spring.
- EE101, Medical Imaging, 2019-2020.
- CS270, Digital Imaging Processing, 2019 Fall.
- SI100D, Introduction to Information Science and technology, 2019 Spring.

► ***Community Services***

- Reviewer of IEEE-TMI, IEEE-JBHI, IEEE-TUFFC, MICCAI.
- Student Chair, Jilin Province Undergraduate Student Innovation Practice Base, 2017-2018.
- Student Chair, Undergraduate Electronic Society, 2016-2017.