



Hongbo Chen

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EDUCATION

Joint-PhD Candidate in Electronic Science and Technology 2018-Present

University of Chinese Academy of Sciences, Beijing, China

ShanghaiTech University, Shanghai, China

School of Information Science and Technology (SIST)

- 3-D Reconstruction
- Ultrasound image processing
- 3-D Freehand ultrasound imaging

Visiting PhD Student 2022-2023

University of Alberta, Edmonton, Canada

Department of Radiology and Diagnostic Imaging

- 3-D Motion Processing
- Geometric Modeling
- 3-D ultrasound intraoral imaging technique

Undergraduate in Electronic Information Engineering 2014-2018

Changchun University of Science and Technology, Changchun, China

- Automatic Control
- Circuit Board and PCB Design

SKILLS

- Development of 3-D reconstruction/detection algorithms using Deep-learning architecture
- C# windows application development based on Microsoft Visual Studio
- Digital image processing based on Matlab
- MCU C language development

AWARDS

- Merit student of ShanghaiTech University 2022
- Outstanding student in SIST of ShanghaiTech University 2021
- National award for The “NXP Cup” Intelligent Car Competition 2017.7
- Provincial award for National Undergraduate Electronics Design Contest 2016.9

- National Training Program of Innovation and Entrepreneurship for Undergraduates 2015-2017
- Received the school-level scholarships and the honor of merit student 2014-2018

RESEARCH PROGRAMS

- Natural Science Foundation of China (NSFC) 2021-2024
Participated, Grant No.12074258
- Alberta Innovates-Accelerating Innovations into CarE (AICE) program, Canada 2022-2024
Participated, Grant No.RES0056222
- Natural Science Foundation of China (NSFC) 2021-2024
Participated, Grant No.82071924
- Natural Science Foundation of Shanghai (NSFS) 2019-2021
Participated, Grant No.19ZR1433800

PATENTS

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

PUBLICATIONS

⇒ † Equal Contribution.

1. **Hongbo Chen**, Logiraj Kumaralingam, Shuhang Zhang, Sheng Song, Fayi Zhang, Haibin Zhang, Thanh-Tu Pham, Kumaradevan Punithakumar, Edmond H M Lou, Lawrence H Le, and Rui Zheng. Neural Implicit Surface Reconstruction of Freehand 3D Ultrasound Volume with Geometric Constraints. *arXiv*, 2024a *Under Review*
2. **Hongbo Chen**, Liyue Qian, Yuchong Gao, Jianhao Zhao, Yiwen Tang, Jiawen Li, Lawrence H. Le, Edmond Lou, and Rui Zheng. Development of Automatic Assessment Framework for Spine Deformity Using Freehand 3-D Ultrasound Imaging System. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 71(3):408–422, March 2024b. ISSN 1525-8955. doi: 10.1109/TUFFC.2024.3351223.
3. **Hongbo Chen**, Rui Zheng, Li-Yue Qian, Feng-Yu Liu, Sheng Song, and Hong-Ye Zeng. Improvement of 3-D Ultrasound Spine Imaging Technique Using Fast Reconstruction Algorithm. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 68(10):3104–3113,

October 2021. ISSN 1525-8955. doi: 10.1109/TUFFC.2021.3087712. **Honored Front Cover for Issue10 VOLUME 68 in OCTOBER 2021**

4. Daohuai Jiang†, **Hongbo Chen**†, Rui Zheng, and Fei Gao. Hand-held free-scan 3D photoacoustic tomography with global positioning system. *Journal of Applied Physics*, 132(7):074904, August 2022a. ISSN 0021-8979. doi: 10.1063/5.0095919
5. **Hongbo Chen**†, Logiraj Kumaralingam†, Jiawen Li, Kumaradevan Punithakumar, Lawrence H Le, and Rui Zheng. Neural Implicit Representation for Three-dimensional Ultrasound Carotid Surface Reconstruction using Unsigned Distance Function. In *2023 IEEE International Ultrasonics Symposium (IUS)*, pages 1–3, September 2023. doi: 10.1109/IUS51837.2023.10307668
6. **Hongbo Chen**, Rui Zheng, Edmond Lou, and Lawrence 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)*, pages 2105–2108, July 2020. doi: 10.1109/EMBC44109.2020.9176614
7. **Hongbo Chen**, Rui Zheng, Edmond Lou, and Dean Ta. Imaging Spinal Curvatures of AIS Patients using 3D US Free-hand Fast Reconstruction Method. In *2019 IEEE International Ultrasonics Symposium (IUS)*, pages 1440–1443, October 2019. doi: 10.1109/ULTSYM.2019.8925758
8. Sheng Song, **Hongbo Chen**, Conger Li, Edmond Lou, Lawrence H. Le, and Rui 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*, February 2022. ISSN 0301-5629. doi: 10.1016/j.ultrasmedbio.2022.01.002
9. Jiawen Li, Yunqian Huang, Sheng Song, **Hongbo Chen**, Junni Shi, Duo Xu, Haibin Zhang, Man Chen, and Rui Zheng. Automatic Diagnosis of Carotid Atherosclerosis Using a Portable Freehand 3-D Ultrasound Imaging System. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 71(2):266–279, February 2024. ISSN 1525-8955. doi: 10.1109/TUFFC.2023.3345740
10. Javaneh Alavi, **Hongbo Chen**, Kim-Cuong T Nguyen, Thanh-Giang La, Logiraj Kumaralingam, Kumaradevan Punithakumar, Maria Alexiou, Edmond H.M. Lou, Michelle Noga, Paul W. Major, and Lawrence H Le. Three-dimensional Intraoral Imaging using a Portable 3D Freehand Ultrasound System: A Phantom Study. In *2023 IEEE International Ultrasonics Symposium (IUS)*, pages 1–4, Montreal, QC, Canada, September 2023. IEEE. ISBN 9798350346459. doi: 10.1109/IUS51837.2023.10308083
11. Daohuai Jiang†, **Hongbo Chen**†, Feng Gao, Rui Zheng, and Fei Gao. Hand-held 3D Photoacoustic Imaging System with GPS. In *2022 IEEE International Ultrasonics Symposium (IUS)*, pages 1–4, October 2022b. doi: 10.1109/IUS54386.2022.9957259
12. Yiwen Tang, **Hongbo Chen**, Liyue Qian, Songhan Ge, Mingbo Zhang, and Rui Zheng. Detection of Spine Curve and Vertebral Level on Ultrasound Images Using DETR. In *2022 IEEE International Ultrasonics Symposium (IUS)*, pages 1–4, October 2022. doi: 10.1109/IUS54386.2022.9958621
13. Honggen Li, **Hongbo Chen**, Wenke Jing, Yuwei Li, and Rui Zheng. 3D Ultrasound Spine Imaging with Application of Neural Radiance Field Method. In *2021 IEEE International Ultrasonics Symposium (IUS)*, pages 1–4, September 2021. doi: 10.1109/IUS52206.2021.9593917