

JIXIN MA

Email: majx@stu.hit.edu.cn Mob: (+86) 18804548698 Homepage: <https://jixin-ma.github.io/>

Address: No. 92 West Dazhi Street, Nan Gang District, Harbin, Heilongjiang Province, China

EDUCATION

Harbin Institute of Technology (HIT), Harbin, China Aug. 2022 - Present

- Master of Engineering in Mechanical Engineering, State Key Laboratory of Robotics and Systems
- Supervisor: *Prof. Zhijiang Du* GPA: **91.03/100** Rank: **21/371 (Top 6%)**

Harbin Institute of Technology (HIT), Harbin, China Aug. 2018 - Jun. 2022

- Bachelor of Engineering in Mechatronics Engineering, School of Mechatronics Engineering
- Supervisor: *Prof. Zhijiang Du* GPA: **94.58/100** Rank: **2/135 (Top 2%)**

Harbin Institute of Technology (HIT), Harbin, China Sept. 2019 - Jun. 2022

- Minor in Artificial Intelligence, School of Computer Science and Technology
- Supervisor: *Prof. Qince Li*

IELTS Score: Overall: 7.0 (Listening: 6.5 Reading: 8.0 Writing: 6.5 Speaking: 6.0)

PUBLICATIONS

- [1] MRI Super-Resolution via Hybrid Information Enhancement Network based on Multi-Attention and Adaptive Convolution

Jixin Ma*, Hongjian Yu*, Zhijiang Du, Xin Hua, Zibo Li, Hui Zhao.

2024 IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2024, Accepted)

- [2] Multi kernel cross sparse graph attention convolutional neural network for brain magnetic resonance imaging super-resolution *[Paper]*

Xin Hua, Zhijiang Du, **Jixin Ma**, Hongjian Yu.

Biomedical Signal Processing and Control, 2024, 96: 106444. (JCR Q1, IF=4.9)

- [3] A Lightweight Multi-scale Multi-angle Dynamic Interactive Transformer-CNN Fusion Model for 3D Medical Image Segmentation *[Paper]*

Xin Hua, Zhijiang Du, Hongjian Yu, **Jixin Ma**, Fanjun Zheng, Chen Zhang, Qiaohui Lu, Hui Zhao.

Neurocomputing, 2024, 608: 128417. (JCR Q1, IF=5.5)

- [4] DFAN: Dual-Frequency Aware Network for 3D MRI Super-Resolution

Jixin Ma, Hongjian Yu, Zhijiang Du, Xin Hua, Zibo Li, Qiaohui Lu, Hui Zhao.

The 39th Annual AAAI Conference on Artificial Intelligence (AAAI 2025, Submitted)

- [5] WSC-Trans: A CNN-Transformer Structure-based 3D Multi-structural Automatic Segmentation Model For Temporal Bone CT

Xin Hua*, **Jixin Ma***, Hongjian Yu, Zhijiang Du, Fanjun Zheng, Chen Zhang

2024 IEEE International Conference on Bioinformatics and Biomedicine (Workshop) (Submitted)

RESEARCH EXPERIENCES

3D Medical Image Super-Resolution Algorithm Based on Deep Learning Aug. 2023 - Present

State Key Laboratory of Robotics and Systems, HIT

Supervisor: Prof. *Zhijiang Du*

- Proposed a dual-frequency aware network for 3D MRI volume super-resolution.
- Proposed an adaptive frequency processing block to extract features of different frequency domains through Fast Fourier Convolution and high-frequency prior, and proposed a novel cross-attention mechanism for feature interaction and aggregation.
- Conducted experiments on two public MRI datasets and outperformed other *SOTA* methods.

- 2D Medical Image Super-Resolution Algorithm Based on Deep Learning**
Sept. 2022 - Aug. 2023

State Key Laboratory of Robotics and Systems, HIT
Supervisor: Prof. Zhijiang Du

 - Proposed a hybrid information enhanced network based on Transformer for 2D MRI super-resolution.
 - Proposed a spatial-channel hybrid attention to enhance specific semantics representation, and proposed a dynamic filter based on content-adaptive convolution to restore high-frequency information.
 - Conducted experiments on two public MRI datasets and outperformed other *SOTA* methods.
- Robot-Assisted Cochlear Implant Planning and Navigation System**
Oct. 2021 - Jun. 2022

State Key Laboratory of Robotics and Systems, HIT
Supervisor: Prof. Zhijiang Du

 - Developed a planning and navigation software based on C++, VTK and Qt, achieving medical image visualization, 3D reconstruction, demonstration of the cochlear implant channel drilling process and ICP registration.
 - Proposed a surgical bone drill registration method for cochlear implant surgery and carried out experiment to verify the feasibility of the new method.
 - Conducted drilling experiments using the cochlear implant robot guided by the designed software to verify the drilling accuracy.
- Bronchus Segmentation Method based on Deep Learning**
Mar. 2022 - Jun. 2022

Research Center of Perception and Computing, HIT
Supervisor: Prof. Qince Li

 - Proposed an improved network based on V-Net for accurate and efficient bronchus segmentation.
 - Trained and tuned hyperparameters on two public bronchus datasets.

PROJECT EXPERIENCES

- Robotic Grasping System for Curling-Stones**
Sept. 2022 - Nov. 2022

Institute for Artificial Intelligence, HIT
Advisor: Prof. Jing Jin

 - Established communication between Kinova Robotic Arm and ROS system on Jetson TX2.
 - Completed the hand-eye calibration of the robotic arm and the camera based on the eye-in-hand method.
 - Achieved the grasping of the curling-stone based on depth information using Kinova Robotic Arm.
- Vision-Based Garbage Classification Detection System**
Sept. 2021 - May. 2022

Engineering Innovation Practice Center, HIT
Advisor: Prof. Feng Zhang

 - Trained YOLOv5 on a self-collected and hand-labeled dataset of garbage images.
 - Deployed YOLOv5 on Jetson Nano using TensorRT and achieved real-time garbage detection.
 - Won the Second prize in the 8th "Delta Cup" International College Green Manufacturing Competition.

AWARDS AND HONORS

- 2019 **National Scholarship for Bachelor Students (8,000 RMB)**
- 2020 **National Scholarship for Bachelor Students (8,000 RMB)**
- 2022 Outstanding Graduate at Harbin Institute of Technology
- 2022 Special Grade Scholarship at Harbin Institute of Technology (22,000 RMB, Top 20%)
- 2023 Special Grade Scholarship at Harbin Institute of Technology (22,000 RMB, Top 20%)
- 2023 **National Scholarship for Master Students (20,000 RMB)**
- 2023 Third Prize in the 19th China Postgraduate Mathematical Contest in Modeling

SKILLS

Tools/Frameworks: Matlab, Solidworks, AutoCAD, Qt, Origin, VTK, ROS, LATEX

Programming: Python, C++, Pytorch