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# Chun Liu

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## EDUCATION

**ShanghaiTech University, Double First-Class**

Sept. 2022 – Jul. 2025

Computer Science and Technology, Master Candidate

Shanghai, China

- GPA: **3.69/4.00**

- Relevant Courses: Principles of Magnetic Resonance Imaging (A+), Medical Image Processing and Analysis (A+), Compressive Sensing (A+), etc.

**Hebei University of Technology (211 Project), Double First-Class**

Sept. 2018 – Jun. 2022

Computer Science and Technology, Bachelor

Tianjin, China

- GPA: **3.88/4.00**, GPA Rank: **3/105**

- Relevant Courses: College Physics I A (100/100), Linear Algebra (99/100), Probability and Statistics (99/100), Computer Image Processing (97/100), etc.

## RESEARCH INTERESTS

Deep Learning for Quantitative MRI, Rapid MRI Sequence Development.

## PUBLICATIONS

- **Chun Liu**, Peng Hu, and Haikun Qi. “Deep-Learning-Based Optimization of k-Space Undersampling in Self-Supervised MRI Reconstruction.” In *2024 ISMRM & ISMRT Annual Meeting & Exhibition, 4507, 2024. (Accepted)*
- **Chun Liu**, Hanxi Liao, Zhenfeng Lyu, Yimin Luo, and Haikun Qi. “SRMapping: A Super-Resolution Network with Multi-Level Fine-Grained Feature Fusion for Cardiac MR T1 Mapping.” In *Medical Imaging 2025. SPIE. (Under Review)*
- **Chun Liu**, Hanxi Liao, Zhenfeng Lyu, Yimin Luo, Peng Hu, and Haikun Qi. “Multi-Scale Cine-Assisted Super-Resolution for Ultrafast Cardiac MR T1 Mapping.” *Medical Image Analysis, 2025. (Manuscript in Preparation)*
- Qinfang Miao, Sha Hua, Yiwen Gong, Zhenfeng Lyu, Pengfang Qian, **Chun Liu**, Wei Jin, Peng Hu, Haikun Qi. “Free-Breathing Non-Contrast T1 $\rho$  Dispersion MRI of Myocardial Interstitial Fibrosis in Comparison with Extracellular Volume Fraction.” *Journal of cardiovascular magnetic resonance, 2024. (Accepted)*

## RESEARCH EXPERIENCE

**Accelerated Cardiac MR T1 Mapping with Deep Learning Methods**

Jul. 2023 – present

*One Conference Paper under Review; One Journal Manuscript in Preparation.*

*Advisor: Prof. Haikun Qi, BME, ShanghaiTech University*

Shanghai, China

- Developed a novel network for CMR T1 mapping that enables simultaneous super-resolution and quantification using only a single inversion recovery (IR) acquisition. This technique reduces breath-hold time, mitigates respiratory artifacts, and enhances signal-to-noise ratio (SNR).
- Engineered a hierarchical transformer-based encoder-decoder network to exploit structural and multi-contrast information, significantly improving CMR T1 mapping accuracy and efficiency. This method achieved comparable T1 maps using only about 10% of the fully sampled data.
- Incorporated a prompt mechanism within the network architecture to utilize additional CMR data, which substantially enhanced super-resolution outcomes in T1 mapping.

**Optimized Undersampling Pattern for Self-Supervised MRI Reconstruction**

Sept. 2022 – Nov. 2023

*ISMRM Accepted.*

*Advisor: Prof. Haikun Qi, BME, ShanghaiTech University*

Shanghai, China

- Optimized sampling trajectories through an end-to-end deep network approach, tailored to self-supervised reconstruction methods and adaptable to different anatomical structures, significantly enhancing SSDU's performance.
- Leveraged MRI physics priors with deep learning by utilizing conjugate gradient descent and ADMM for 4-fold accelerated multi-coil data to achieve high-quality reconstruction, which required minimal training data and eliminating the need for fully sampled data.

### Dynamic MRI Reconstruction Using Self-Supervised Learning

Oct. 2021 – May. 2022

*Outstanding Undergraduate Thesis Award (Top 10%), Class of 2022, Hebei University of Technology.*

*Advisor: Prof. Haikun Qi, BME, ShanghaiTech University*

Shanghai, China

- Developed a self-supervised cardiac cine reconstruction framework with a parallel architecture, achieving performance comparable to fully supervised methods using only 25% of cardiac cine data.
- Leveraged a 3D U-Net architecture to aggregate neighboring information during the reconstruction process, significantly enhancing the accuracy of cine detail recovery.

## ADDITIONAL EXPERIENCE

### Research Tool Development

- Streamlined and automated DICOM data processing from MRI scanners, reducing processing time by about 75% and minimizing manual intervention. This process included data selection, region of interest extraction, coil combination, noise reduction, registration, and exponential fitting, all accomplished through an automated interactive program developed with Matplotlib, OpenCV, PyTorch and MATLAB.

### Collaboration and Project Management

- Developed an integrated workflow for data sharing, code management, and remote resource allocation, enabling seamless research content synchronization across platforms. This was achieved through code synchronization with Git, cloud-based code sharing via GitHub, and remote resource scheduling using SSH.

### International Engagement and Presentation

- Presented a digital poster at the 2024 ISMRM & ISMRT conference, attracting considerable attention from attendees. Engaged in continuous discussions throughout the exhibition, introducing my research and addressing numerous questions.

### Volunteer Service

- Volunteered in the 2022 Winter Olympics as a broadcast assistant.
- Taught in a remote village in Chengde, Hebei, during a two-week summer program, encouraging local children to pursue education.

## HONORS & AWARDS

Hebei Province Outstanding Graduates (Top 3%)	2022
Meritorious Winner in Mathematical Contest in Modeling (MCM) (Top 7%)	2021
Hebei University of Technology First-Class Scholarship (Top 5%)	2020
Merit Student (Top 10%, twice)	2023, 2021
Third Prize in the 14th iCAN International Innovation and Entrepreneurship Competition	2020
Second Prize in the Hebei Province Undergraduate Mathematics Competition	2019
First Prize in Undergraduate Summer Social Practice	2019

## SKILLS & OTHERS

**Programming Languages:** Python (Proficient); MATLAB, C, C++ (Expert); x86 Assembly, C#, HTML (Competent).

**Software:** PyTorch, DICOM, TensorBoard, MONAI, Matplotlib, OpenCV, Git, Linux.

**English:** Proficient (CET-4: 566, CET-6: 455).