

Ruimin Feng

<https://github.com/Ruimin-Feng> | Fengruimin@sjtu.edu.cn | +86-15927363918

Summary

Currently, I am a fifth-year PhD student majoring in biomedical engineering at Shanghai Jiao Tong University. I am expected to receive my doctoral degree in September this year. My research focuses on **unsupervised machine learning for fast MRI and multiparametric quantitative MRI reconstruction, quantitative susceptibility mapping (QSM), and susceptibility tensor imaging (STI)**.

Education

- 2019-present PhD Student, Shanghai Jiao Tong University, Shanghai, China
Advisor: Hongjiang Wei
- 2015-2019 BSc, Huazhong University of Science and Technology, Wuhan, Hubei, China
Honors: Outstanding Undergraduates in Term of Academic Performance (top 1%)

Research Experience

- 2023.10-present **Multiparametric Quantitative MRI Reconstruction via Implicit Neural Representation**
Developed a training database-free and calibrationless deep learning method
Achieved direct reconstruction of T1, T2, T2*, and phase maps from the undersampled k-space
- 2022.5-2023.10 **Fast MRI Reconstruction via Implicit Neural Representation**
Developed a training database-free deep learning method
Achieved joint estimation of sensitivity maps and the MRI image
Improved reconstruction results at higher acceleration rates ($R > 4$ along one phase encoding direction)
- 2021.5-2022.5 **Improved STI model**
Proposed an improved STI model incorporating non-bulk-magnetic-susceptibility effects
Achieved more reliable estimations for magnetic susceptibility anisotropy (MSA) and white matter fiber directions
- 2019.9-2021.5 **Model-based Deep Learning for QSM Reconstruction**
Embedded convolutional neural networks into the QSM physical model
Achieved high-quality QSM reconstruction from the single-head-orientation phase data

Publications

Journal Articles

- Ruimin Feng**, Qing Wu, Jie Feng, Huajun She, Chunlei Liu, Yuyao Zhang, and Hongjiang Wei (2024). "IMJENSE: Scan-Specific Implicit Representation for Joint Coil Sensitivity and Image Estimation in Parallel MRI". In: *IEEE Transactions on Medical Imaging* 43.4, pp. 1539–1553.
- Ruimin Feng**, Steven Cao, Jie Zhuang, Jiayi Zhao, Xiaojun Guan, Yuyao Zhang, Chunlei Liu, and Hongjiang Wei (2023). "An improved asymmetric susceptibility tensor imaging model with frequency offset correction". In: *Magnetic Resonance in Medicine* 89.2, pp. 828–844.

Ruimin Feng, Jiayi Zhao, He Wang, Baofeng Yang, Jie Feng, Yuting Shi, Ming Zhang, Chunlei Liu, Yuyao Zhang, Jie Zhuang, and Hongjiang Wei (2021). “MoDL-QSM: Model-based deep learning for quantitative susceptibility mapping”. In: NeuroImage 240, p. 118376. ISSN: 1053-8119.

Zhenghao Li[#], **Ruimin Feng**[#], Qiangqiang Liu, Jie Feng, Guoyan Lao, Ming Zhang, Jun Li, Yuyao Zhang, and Hongjiang Wei (2023). “APART-QSM: An improved sub-voxel quantitative susceptibility mapping for susceptibility source separation using an iterative data fitting method”. In: NeuroImage 274, p. 120148. ISSN: 1053-8119. **(Co-first Author)**.

Yuting Shi[#], **Ruimin Feng**[#], Zhenghao Li, Jie Zhuang, Yuyao Zhang, and Hongjiang Wei (2022). “Towards in vivo ground truth susceptibility for single-orientation deep learning QSM: A multi-orientation gradient-echo MRI dataset”. In: NeuroImage 261, p. 119522. **(Co-first Author)**.

Conference Proceedings

Ruimin Feng, Qing Wu, Yuyao Zhang, and Hongjiang Wei (2023). “A scan-specific unsupervised method for parallel MRI reconstruction via implicit neural representation”. In: 2023 IEEE 20th International Symposium on Biomedical Imaging (ISBI). IEEE, pp. 1–5.

Ruimin Feng, Qing Wu, and Hongjiang Wei (2023). “IMJENSE: scan-specific IMplicit representation for Joint coil sENSitivity and image Estimation in parallel MRI”. In: Proceedings of the 31th Annual Meeting of ISMRM. TORONTO, CANADA, p. 0820. **(MAGNA CUM LAUDE AWARD)**.

Ruimin Feng, Steven Cao, Chunlei Liu, and Hongjiang Wei (2022). “An improved asymmetric susceptibility tensor imaging model with frequency offset correction”. In: Proceedings of the 30th Annual Meeting of ISMRM. LONDON, UK, p. 4719.

Ruimin Feng, Yuting Shi, Jie Feng, Yuyao Zhang, and Hongjiang Wei (2021). “MoG-QSM: A Model-based Generative Adversarial Deep Learning Network for Quantitative Susceptibility Mapping”. In: Proceedings of the 29th Annual Meeting of ISMRM. Online, p. 0331. **(Oral)**.

Skills

- Solid background in MRI physics, especially in QSM and STI
- Proficiency in supervised and unsupervised deep learning
- Skilled in MATLAB and Python