

Ruimin Feng

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Summary

I am a PhD graduate from Shanghai Jiao Tong University, having completed my degree in September, 2024. My research focuses on **deep learning-based reconstruction methods for fast and quantitative MRI, simultaneous multiparametric quantitative MRI, quantitative susceptibility mapping (QSM), and susceptibility tensor imaging (STI)**.

Education

- 2019-2024 PhD, Shanghai Jiao Tong University, Shanghai, China
Advisor: Hongjiang Wei
Honors: Outstanding Graduate of Shanghai Jiao Tong University
- 2015-2019 BSc, Huazhong University of Science and Technology, Wuhan, Hubei, China
Honors: Outstanding Undergraduates in Term of Academic Performance (top 1%)

Research Experience

- 2023.10-2024.9 **Multiparametric Quantitative MRI Reconstruction via Implicit Neural Representation**
Developed a training database-free deep learning-based reconstruction method
Achieved direct reconstruction of 3D T1, T2, T2*, and phase maps from the undersampled k-space, enabling subsequent QSM and sub-voxel QSM reconstruction
- 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 accurate QSM reconstruction from 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.

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. (**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). Cartagena, Colombia, 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. (**Power Pitch, Magna Cum Laude Merit 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. (**Power Pitch**).

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
- Operation on MRI scanners for in vivo experiments