Xin Wang (She/Her/Hers)

School of Biomedical Engineering
Shanghai Jiao Tong University, Shanghai, China
Phone: +86 15601840201
E-mail: wangxin1007@sjtu.edu.cn

Education

Shanghai Jiao Tong University — Shanghai, China
Candidate for Master of Electric and Information Engineering — *Expected March 2024*
GPA: 3.72/4.0

Shanghai University — Shanghai, China
Bachelor of Intelligent Science and Technology — *2017-2021*
GPA: 3.82/4.0 (Ranked 1/62)

Research

Master's Project: Arbitrary-Scale MRI Super-Resolution (2021-2023)

- Arbitrary reduction of MRI slice spacing based on *Spatial Attention-based Implicit Neural Representation* (SA-INR) network. The key idea of SA-INR is to represent an anisotropic MR volume as a continuous implicit function of coordinates, such that an isotropic volume can be sampled from the continuous coordinate system and then generated from the implicit function (major revision, *Medical Image Analysis* [1]).
- Arbitrary reduction of MRI slice spacing based on via *Hierarchical Feature Conditional Diffusion* (HiFi-Diff). Given two adjacent MR slices and the relative positional offset, HiFi-Diff can iteratively convert a Gaussian noise map into any desired in-between MR slice (accepted by *MICCAI Workshop 2023 on Machine Learning in Medical Imaging* [2]).

Master's Project: Cross-view Aligned Segmentation of Knees (2022-2023)

- A novel framework is proposed for generating cross-view consistent 3D knee segmentation via super-resolution and graph representation with clinical 2D multi-view scans and sagittal annotations. (accepted by *MICCAI 2023*[3]).

Master's Project: Cross-Modality Synthesis and Super-Resolution (2022-2023)

- A unified network, integrating the tasks of cross-modality synthesis and super-resolution coherently. The network is also empowered by an alias-free design to preciously generate high-frequency details and efficiently suppress the aliasing artifacts (accepted by *MICCAI 2023*[4]).

Master's Project: Self-Supervised MRI Super-Resolution (2023-Present)

- A three-stage super-resolution framework, combines the advantages of supervised training on publicly available datasets, which offers high performance and generalization, with the ability to be transferred to clinical scenarios where only low-resolution datasets are accessible.

Master's Project: Clue Cell Detection and Classification (2021-2022)

- Designing a set of learning-based algorithm for clue cell detection and classification, achieving high-precision sample classification with a false-negative rate of 19% and a false-positive rate of 0.96%.
- The algorithm has been deployed on digital pathology scanners and is in use across multiple hospitals and pathology centers.

Master's Project: Cervical Cytopathological Image Synthesis (2023-Present)

- Designing a framework to synthesize high-resolution cervical cytopathological images with abnormal cells for data augmentation of cervical abnormality screening.
- The framework incorporates PEFT techniques in building generative models upon Stable Diffusion, and provides explicit controls over the number, the location, and the cell type of abnormal cells, as well as the image resolution.

Research Interest

- During my college years, I took many professional courses in the direction of Artificial Intelligence, such as Pattern Recognition, Computer Vision and Machine Learning, equipped with good programming ability.
- During my master's, my research-oriented work is based on the super-resolution of MRI and its impact on downstream tasks. In addition, I did some engineering work, such as cervical microorganism detection, pathological image generation and super-resolution.
- My research interests lie in medical image generation and image quality improvement. Recently, I have been working on the connection between video learning and 3D medical image learning, hoping to improve the performance of subsequent medical tasks through the pre-training of video tasks.

Awards

- Chinese Collegiate Computing Competition, Artificial Intelligence Challenge, Second Prize, 2019
- National College Student Robot Competition, RoboMaster University Series, Second Prize, 2020
- Scholarship of Shanghai City, 2019 & 2020
- Shanghai University, Innovation and Entrepreneurship Scholarship, 2018
- Shanghai University, Outstanding Academic Scholarship, 2018 & 2019 & 2020
- Shanghai University, Outstanding Student Award, 2018 & 2019 & 2020
- Shanghai Jiao Tong University, Graduate Academic Excellence Scholarship, 2022

Publications

1. **X. Wang***, S. Wang*, H. Xiong, K. Xuan, Z. Zhuang, M. Liu, Z. Shen, X. Zhao, L. Zhang, Q. Wang, "Spatial Attention-based Implicit Neural Representation for Arbitrary Reduction of MRI Slice Spacing". *Medical Image Analysis*. Major Revision.
2. **X. Wang***, Z. Shen*, S. Wang, Z. Song, M. Liu, L. Zhang, K. Xuan, Q. Wang, "Arbitrary Reduction of MRI Inter-slice Spacing Using Hierarchical Feature Conditional Diffusion". *International Workshop on Machine Learning in Medical Imaging*, 2023.
3. Z. Zhuang*, **X. Wang***, S. Wang, Z. Shen, X. Zhao, M. Liu, Z. Xue, D. Shen, L. Zhang, Q. Wang, "CAS-Net: Cross-view Aligned Segmentation by Graph Representation of Knees". *Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2023.
4. Z. Song, **X. Wang**, X. Zhao, S. Wang, Z. Shen, Z. Zhuang, M. Liu, Q. Wang, L. Zhang, "Alias-Free Co-Modulated Network for Cross-Modality Synthesis and Super-Resolution of MR Images". *Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2023.