LIXUAN CHEN

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EDUCATION

ShanghaiTech University Sep. 2021 - Exp July 2024
M.S.E in Computer Science, GPA 3.63/4 (Major: 3.73/4); Advisor: Prof. Yuyao Zhang
Core Course: Deep learning, Medical image processing and analysis, Digital Image Processing

ShanghaiTech University Sep. 2017 - July 2021
B.E. Computer Science and Technology, GPA 3.39/4

RESEARCH INTEREST

• My research interests lie in the field of **computer vision** and **medical image processing**, from the perspective of **implicit neural representation**, **fetal brain reconstruction**, and **weakly/semi-supervised segmentation**.

PROJECTS

• **Longitudinal Brain Atlases Construction via implicit neural representation.** July 2021 - present

- Existing longitudinal atlas construction methods averaged brain images on discrete time points independently, leading to temporal inconsistency issue.
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• **Robust Self-supervised Volume Reconstruction for Fetal Brain MRI.** July 2021 - present

- Proposed a learning-based self-supervised volume reconstruction technique, which overcomes challenges in fetal brain MRI studies caused by motion artifacts and slice misalignment.
- Combined a comprehensive forward model and under-parameterized deep decoder structure to reduce network overfitting and image artifacts caused by slice misalignment and motion
- Our method achieves the state-of-the-art performance on both simulated MRI from brain atlas and real clinical scanning fetus MR data.

• **Self-supervised Slice-to-Volume Registration Despite Fetal Motion.** July 2021 - present

- Formulate the slice-to-volume (SVR) as a function that maps the input 2D thick slice and the target 3D volume to a rigid transformation matrix, to address the challenge of fetal motion.
- Our method achieves high-accuracy SVR performance on severe motion-corrupted fetal MRI data with various in-plane resolutions and slice thicknesses.

• **Longitudinal Infant Brain MRI Segmentation.** March 2021 - May 2021

- Investigate different segmentation model designs and extend DenseNet to 3D volumetric data to to perform 3D volumetric segmentation.
- The method achieves dice similarity coefficient (DSC) of 90.325% of three brain tissues across five time points.

PUBLICATIONS

[1] **Continuous longitudinal fetus brain atlas construction via implicit neural representation**
Lixuan Chen, *Jiangjie Wu, Qing Wu, Hongjiang Wei, Yuyao Zhang*
• Published on *MICCAI workshop PIPPI 2022* **(Best Paper Honorable Mention)**

[2] **ASSURED: A Self-supervised Deep Decoder Network for Fetus Brain MRI Reconstruction**
Jiangjie Wu, ***Lixuan Chen****, Zhenghao Li, Lihui Wang, Rongpin Wang, Hongjiang Wei, Yuyao Zhang*
• Published on *ISBI 2023*

[3] **ALIGNER: A Self-supervised Slice-to-Volume Registration Network for Fetal Brain MRI Reconstruction**
*Jiangjie Wu, **Lixuan Chen**, Zhenghao Li, Lihui Wang, Rongpin Wang, Hongjiang Wei, Yuyao Zhang*
• Manuscript submitted to *MICCAI 2023*

[4] **COLLATOR: Consistent Spatial-Temporal Longitudinal Atlas Construction via Implicit Neural Representation**
***Lixuan Chen**, Jiangjie Wu, Qing Wu, Guoyan Lao, Hongjiang Wei, Yuyao Zhang*
• Manuscript submitted to *NeuroImage*

EXPERIENCE

Bell Labs Dec. 2020 - June 2021
Research Internship (Part-time); Supervisor: Dr. Chenhui Ye, Dr. Wenyi Xu, Dr. Fei Gao *Shanghai, China*

- Propose a behavior recognition method based on meta-learning using WiFi channel state information(CSI).
- Our method enables the model to rapidly adapt to new environments, as demonstrated through its performance on two public datasets and real-world data, in comparison to traditional supervised learning.

TEACHING

CS270: Digital Image Processing 2021 Fall

ADDITIONAL

- Programming: Python, C++, C, MATLAB, LaTeX
- Languages: Chinese (Native), English (Fluent)
- Framework: PyTorch