

QIJIA SHEN

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EDUCATION

Shanghai Jiao Tong University (SJTU)

B.E. in Biomedical Engineering

09/2017~06/2021

- **Major GPA:** 3.79/4.00
- **Coursework:** Biomedical Image Process, Digital Signal Processing, Signals and Systems, Algorithm and Data Structures, Automatic Control Theory, Principles and Applications of MRI

University of Oxford

Ph.D. in Clinical Neurosciences

10-2021~10/2024(expected)

PUBLICATIONS

- [1] Ming Zhou, Lichi Zhang, Xiaping Du, Xi Ouyang, Xin Zhang, **Qijia Shen**, Qian Wang. Hierarchical and Robust Pathology Image Reading for High-Throughput Cervical Abnormality Screening. *MICCAI 2020*
- [2] Ming Zhou, Xiaping Du, Xi Ouyang, Xin Zhang, **Qijia Shen**, Xiangshan Fan, Qian Wang. Hierarchical and Robust Pathology Screening for Cervical Abnormality. *Computerized Medical Imaging and Graphics*
- [3] **Qijia Shen**, Mark Chiew, Wenchuan Wu, Thomas Okell. Efficient 3D cone trajectory design for improved combined angiographic, structural and perfusion imaging using arterial spin labelling. *ISMRM Workshop on Data Sampling & Image Reconstruction 2023*

RESEARCH EXPERIENCES

Learning 3D models from 2D images in the wild

10/2022~Now

Advisor: Guangrun Wang, Philip Torr, Department of Engineering Science, University of Oxford

- Learned to generate 3D models and synthesize novel views via training on the unstructured 2D dataset ImageNet with complex background and without information of camera pose based on StyleGAN2-ADA.
- Developed min-view to avoid synthesizing the views that existed in the dataset and prevent overfitting.
- Applied an ensemble of pre-trained vision models as additional discriminators to stabilize training and speed up convergence.
- (Ongoing) Developing a diffusion-based method to learn 3D models on large-scale 2D datasets and avoid mode-collapse.

Subspace reconstruction for high temporal resolution angiography

10/2022~Now

Advisor: Thomas Okell, Nuffield Department of Clinical Neurosciences

- Applied a kinetic model of blood flow to construct the dictionary of signal variations. SVD was then used to extract principal components. The reconstruction was transformed into estimating coefficient maps for principal components to reduce computational requirements.
- (Ongoing) Estimating the accurate blood flow rate using the high temporal resolution dynamic angiograms.

Efficient 3D sampling trajectory design for combined angiography and perfusion

10/2021~10/2022

Advisor: Thomas Okell, Nuffield Department of Clinical Neurosciences

- Designed a two-stage trajectory to achieve better sampling at different regions of k -space to improve the image quality of both the high spatial-temporal resolution angiography and low spatial-temporal resolution perfusion images.
- Applied locally low-rank constraints across different frames for denoising.
- Validated the trajectory in the in-vivo acquisition of healthy subjects.
- Presented (oral) at *BIC-ISMRM*, and *ISMRM Workshop on Data Sampling & Image Reconstruction*

Connectomics Segmentation

7/2020~10/2020

Advisor: Hanspeter Pfister, School of Engineering and Applied Sciences, Harvard University

- Modified 3D-UNet to predict instance segmentation on MitoEM dataset (Largest mitochondria dataset, 4096x4096x1000).
- Experimented Flux and Distance Transform representations to deal with false split.
- Applied semi-supervised learning in segmentation problem and extended the consistency regularization to pixel level in segmentation.
- Achieved 10% better (AP-75) than MitoEM benchmark in *MICCAI 2020*.

Multi-Organ Nuclei Segmentation and Classification

1/2020~7/2020

Advisor: Qian Wang, School of Biomedical Engineering, SJTU

- Implemented a Hover-Net model to reproduce result on the *MoNuSAC*.
- Designed specific color augmentation in processing pathological images and increased the accuracy from 50% to 86% in classification of neutrophil.
- Constructed a two-stage model and achieved 3rd on the leader board in *MoNuSAC* competition.

Real-time Detection of Carcinoma Pharyngeal in Endoscope

12/2019~3/2020

Advisor: Dahong Qian, School of Biomedical Engineering, SJTU

- Designed experiments to compare the importance of texture information and geometric information in diagnosing cancer in endoscope.
- Applied CAM to offer localization with the help of heatmap.
- Achieved 0.82 in F1 Score and 61 fps in real-time prediction.

Brain MRI Segmentation

9/2019~12/2019

Advisor: Qiu Huang, School of Biomedical Engineering, SJTU

- Combined morphological process, Otsu and region growing to segment white matter hyperintensities.
- Combined segmentation of T1&T2 to reduce portion of false positive.
- Designed and implemented a GUI interface to load, process and display.

AWARDS & PRIZES

- ISMRM student travel grant (\$500) 2023
- Competitive conference and fieldwork funding (£1000) 2022, 2023
- Chun Tsung Scholar (Honorable research funding for prospective undergraduate, 1.2%) 2019
- China Undergraduate Mathematical Contest in Modelling: First Prize(Top 0.7%, Nationwide) 2019
- MicroPort Undergraduate Scholarship (top 3% in SJTU) 2018, 2019
- Undergraduate Excellent Scholarship (top 2%, in SJTU) 2018

SKILLS

- **Languages:** MATLAB, Python, C/C++
- **Frameworks:** PyTorch, TensorFlow, LaTeX, Git, SolidWorks, ROS, Siemens IDEA sequence