Runze Xu

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Male, March 20th, 2003

EDUCATION

08/2021 - present **B.Eng. in Electronic Engineering**, Tsinghua University, China

- **Overall GPA:** 3.85/4.0, Major GPA: 3.85/4.0
- **Core Courses:** Signals and Systems (A) / Fundamental of digital logic and processor (A) / Computer Program Design (A) / Project Design and Making of Electronic System (A) / Basic Experiments for Electronic Circuits and Systems (A) / Fundamental Experiment of Digital Logic and Processor (A) / Data and Algorithm (A-)

RESEARCH EXPERIENCES

03/2020 - present
Center for Biomedical Imaging Research, Department of Biomedical Engineering, School of Medicine, Tsinghua University
Supervisor: Qiyuan Tian, Ph.D.

Project 1

Detecting silent lesions in hypoxic-ischemic encephalopathy using submillimeter isotropic resolution diffusion MRI

- Conducted the reconstruction of high-resolution brain DWI images and demonstrated effectiveness of using Generalized SLIce Dithered Enhanced Resolution Simultaneous MultiSlice (gSlider-SMS) in hypoxic-ischemic encephalopathy (HIE) diagnosis.
- Collaborated with radiologists to acquire appropriate patient data and analyze the role of g-Slider sequences in clinical HIE practice.
- Demonstrated that ischemic lesions and cytotoxic edema invisible on standard clinical images can be found on submillimeter resolution diffusion MRI data using gSlider sequences.

Project 2

High-fidelity low-field brain MRI using a self-supervised denoising network

- Designed and conducted the data experiments of denoising low-field MRI brain images with self-supervised networks and achieved distinct and adjustable denoising effects.
- Realized the neural network MU-Net based on Tensorflow and adopted pairwise averaging tricks to alleviate blurring during denoising iterations.
- Demonstrated that the SNR bottleneck of the low-field MRI can be overcome using self-supervised denoising networks.

PUBLICATIONS

1. **Xu R**, Liao Y, Sun Y, Zhu J, Chen X, Qu H. "Detecting Silent Lesions in Hypoxic-ischemic Encephalopathy using Submillimeter Isotropic Resolution Diffusion MRI." Annual Scientific Meeting of the International Society for Magnetic Resonance in Medicine, 2024. (Under Review)
2. **Xu R**, Li Z, Li Z, Hou W, Luo H, Wu Z, Guo H, Tian Q. "High-fidelity low-field brain MRI using a self-supervised denoising network." The AI Health Summit, 2023.

LEADERSHIP AND ACTIVITIES

10/2023 - 11/2023 Organizer of large-scale social practical activities around Beijing
10/2023 - 11/2023 Organizer of lectures on political economics in the Department of Electronic Engineering
07/2022 - 09/2022 Leader of the team in the Hardware Design Competition

SELECTED HONORS AND AWARDS

2023 Scholarship for Comprehensive Excellence, Tsinghua University (top 1 in the Department of Biomedical Engineering)
2022 Scholarship for Comprehensive Excellence, Tsinghua University (top 2 in the Department of Biomedical Engineering)
2022 Third Prize of the Hardware Design Competition (top 15 in 120 teams)

SKILLS

Programming: MATLAB, Python, PyTorch, TensorFlow, Keras, C/C++, Verilog, MIPS, Assembler Language
Language: Mandarin Chinese (native speaker), English (Proficient in reading, speaking, listening, and scientific writing)
English (**TOEFL 111:** reading 30, listening 30, speaking 24, writing 27)