

HAOWEI XIANG

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Email: haoweix@umich.edu

EDUCATION

Ph.D in Electrical and Computer Engineering

GPA: 3.93/4.0

University of Michigan, Ann Arbor

Sep 2019 - May 2024

Master of Science in Electrical and Computer Engineering

GPA: 3.95/4.0

University of Michigan, Ann Arbor

Sep 2017 - Apr 2019

Bachelor of Science,

Ranking: 3/207

Huazhong University of Science and Technology, China

Sep 2013 - Jun 2017

Selected to **Qiming Honor Program** (top 10%)

Outstanding Graduates Award & Excellent Academic Performance Scholarship

RESEARCH FOCUS

Optimization (model-based and data-driven), **Machine Learning**, **Time series signal processing** (statistical methods), **Imaging and reconstruction** (MRI, SPECT, CT)

RELATED COURSE EXPERIENCE

Teaching Assistant

EECS 501: **Probability and Random Process**

WINTER 23

EECS 551: **Matrix Methods** for Signal Processing, Data Analysis and Machine Learning

FALL 22 & FALL 20

Student

EECS 545: **Machine Learning**; IOE 611: **Convex Optimization**;

SKILLS

Programming

Python, MATLAB, Julia, SQL, C

Machine Learning

Pytorch, Tensorflow

Computer

Cloud Computing, Linux, SLURM, Latex, Git

COMPETITIVE GAMING

Poker

Winning rate over **15BB/100** at NL30 & 50 (over 200k hand)

HearthStone

highest ranking **#13 in NA**

PET PROJECTS

Style transfer learning

Using GAN to transfer the style of realistic scenes to artistic style

Language Model

Building MRIGpt: a transformer chatbot fine-tuned to answer MRI-related questions

SELECTED RESEARCH EXPERIENCE

Research Assistant

Sep 2019 - Present

Advisor: Jeffrey A. Fessler, Douglas C. Noll

EECS, University of Michigan, Ann Arbor, MI

RF pulse design, sampling trajectories optimization and image reconstruction for novel silent MRI pulse sequence

- Reconstructed images using model-based methods and learning-based methods, including **Plug-and-Play, unrolled neural networks** to resolve image artifacts and improve image resolution
- Optimized 3D non-Cartesian sampling trajectories using **learning-based methods** to optimize the gradients and trajectories under the constraints of gradient peak amplitude and slew rate

- Developed spatial-temporal reconstruction methods including **UNFOLD** and **Low-rank models** for in-vivo fMRI data to boost the functional analysis

Research Assistant

Sep 2019 - Sep 2020

Advisor: Jeffrey A. Fessler, Douglas Noll

fMRI lab, University of Michigan, Ann Arbor, MI

Solved **non-linear complex optimization problem** for phase pre-compensating RF pulse design.

Research Assistant

Jan 2019 - Nov 2019

Advisor: Yuni K. Dewaraja, Jeffrey A. Fessler

Medical School, University of Michigan, Ann Arbor, MI

This project aims to build a deep Convolutional Neural Networks to fastly and accurately predict scatter distribution of 3D SPECT/CT imaging.

- Designed **multi-input physics-informed neural network** architecture tailored to 3D SPECT/CT system
- Predicted the distribution of scatter from SPECT/CT using **deep convolutional neural network** and the estimation shows good alignment to the gold standard method
- Reduced the computational time for **over 100X** from multiple hours using **Monte-Carlo simulation** to one minute using GPU.

Research Assistant

Jan 2018 - Aug 2018

Advisor: Jeffrey A. Fessler

EECS, University of Michigan, Ann Arbor, MI

Acceleration of Convolutional Dictionary Learning and Convolutional Analysis Operator Learning by applying sketching method. [This project won the first place in the KLA-Tensor Image Processing Contest.](#)

SELECTED PUBLICATIONS

Smooth Optimization Algorithms for Global and Locally Low-rank Regularizers

Rodrigo A. Lobos, Javier Salazar-Cavazos, **Haowei Xiang**, Douglas C. Noll, Raj Rao Nadakuditi, Jeffrey A. Fessler
Computational Imaging Workshop 2024

Joint optimization of multi-echo reconstruction and quantitative map estimation in Looping Star

Haowei Xiang, Jeffery A. Fessler, Douglas C. Noll

(Oral) In proceedings of 2024 Joint Annual Meeting ISMRM-ESMRMB (ISMRM)

[Model-based reconstruction in looping-star MRI](#)

Haowei Xiang, Jeffery A. Fessler, Douglas C. Noll

Magnetic Resonance in Medicine (2024)

[Model-based reconstruction for looping-star pulse sequences in mri](#)

Haowei Xiang, Jeffery A. Fessler, Douglas C. Noll

US Patent 18138211

[Spatial-temporal Reconstruction using UNFOLD in Looping-star silent fMRI](#)

Haowei Xiang, Jeffery A. Fessler, Douglas C. Noll

In proceedings of 2023 Joint Annual Meeting ISMRM-ESMRMB (ISMRM)

[Model-based Image Reconstruction in Looping-star MRI](#)

Haowei Xiang, Jeffery A. Fessler, Douglas C. Noll

In proceedings of 2022 Joint Annual Meeting ISMRM-ESMRMB (ISMRM)

[A deep neural network for fast and accurate scatter estimation in quantitative SPECT/CT under challenging scatter conditions](#)

Haowei Xiang, Hongki Lim, J A Fessler, Yuni K Dewaraja

European journal of nuclear medicine and molecular imaging (2020): 1-12.

[SPECT/CT scatter estimation using a deep convolutional neural network: implementation in Y-90 imaging](#)

Haowei Xiang, Hongki Lim, J A Fessler, Yuni K Dewaraja

(Oral) 2019 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)