

XIAOJIAN XU

URL: <https://xuxiaojian.github.io/>

✉xiaojianxu@wustl.edu ☎+1 314-203-8568

EDUCATION

Washington University in St. Louis (WUSTL), St. Louis, MO, USA 9/2017–Present

- Ph.D student in Computer Science (GPA: 3.87/4.00), advised by Dr. Ulugbek Kamilov

University of Electronic Science and Technology of China (UESTC), Chengdu, China 9/2014–6/2017

- M.Eng in Communication & Information Engineering (GPA: 3.65/4.00)

University of Electronic Science and Technology of China (UESTC), Chengdu, China 9/2010–6/2014

- B.Eng in Communication Engineering (GPA: 3.89/4.00)

RESEARCH EXPERIENCE

Plug-and-Play approach 8/2018 – Present

- Conduct mass of empirical experiments and theoretical analysis on the Plug-and-Play research.
- Investigated and worked on various image denoisers.

Learning-based magnetic resonance imaging (MRI) / quantitative-MRI 7/2018 – Present

- Developed various machine learning methods for different MRI reconstruction tasks.
- Implemented and trained various neural networks.

Compressed proximal algorithm for nonconvex stochastic optimization 9/2018 – 1/2019

- Developed two compressed proximal based algorithms for stochastic optimization problems.
- Implemented models and experiments and were the first to prove the convergence of the algorithm.

Convolutional dictionary learning for medical image reconstruction 3/2018 – 6/2018

- Implemented a novel convolutional dictionary learning method for image reconstruction problems.
- Compared the performance with traditional patch-wise dictionary learning method.

Some earlier research experience 3/2014 – 6/2017

- Development of Intelligent Home System.
- Design routing and resource scheduling algorithms for large-scale network SDN.

LIST OF PUBLICATIONS

Preprints

- **X. Xu**, J. Liu, Y. Sun, B. Wohlberg, and U. S. Kamilov, "Boosting the Performance of Plug-and-Play Priors via Denoiser Scaling", Accepted by Asilomar Conference 2020.
- **X. Xu**, Y. Sun, Z. Wu, B. Wohlberg, U.S. Kamilov, "Scalable Plug-and-Play ADMM with Convergence Guarantees", Submitted to Journal 2021.
- J. Liu, Y. Sun, W. Gan, **X. Xu**, B. Wohlberg, U.S. Kamilov, "SGD-Net: Efficient Model-Based Deep Learning with Theoretical Guarantees", Submitted to Journal 2021.
- J. Liu, Y. Sun, W. Gan, **X. Xu**, B. Wohlberg, U.S. Kamilov, "Stochastic Deep Unfolding for Imaging Inverse Problems", Accepted by ICASSP 2021.

Published

- **X. Xu**, Y. Sun, J. Liu, B. Wohlberg, U.S. Kamilov, "Provable Convergence of Plug-and-Play Priors with MMSE denoisers", IEEE Signal Processing Letters 27, 1280 - 1284, 2020.
- **X. Xu**, O. Dhifallah, H. Mansour, P. Boufounos, P. Orlik, "Robust 3D Tomographic Imaging of the Ionospheric Electron Density", IEEE IGARSS, 2020.
- **X. Xu** and U. S. Kamilov, "signProx: One-Bit Proximal Algorithm for Nonconvex Stochastic Optimization", IEEE ICASSP 2019.
- J. Liu, Y. Sun, **X. Xu**, and U. S. Kamilov, "Image Restoration using Total Variation Regularized Deep Image Prior", IEEE ICASSP 2019.

INVITED TALKS

- SIAM Conference on Imaging Science 2020, 07/2020
- UCLouvain, Image and Signal Processing Group Seminar, 09/2020

REVIEWER EXPERIENCE

- **Conferences:** International Symposium on Biomedical Imaging (ISBI)
- **Journals:** IEEE Transactions on Image Processing (TIP)

WORK EXPERIENCE

Mitsubishi Electric Research Laboratories (MERL) 5/2019–8/2019
Intern Boston

- Researcher, conduct 3D Tomographic Imaging with GPS data and write paper.

(Head) TA for Optimization 1/2019–Present
Assistant Instructor St. Louis

- Worked as an assistant instructor for course "Optimization" and "Large-Scale Optimization for Data Science" for four semesters. Teach tutorial sessions, hold office hours, answer questions online, develop tests and solutions, and help grad exams and homeworks.

Students supervision 7/2018–Present
Research Supervisor St. Louis

- Eddie Chandler, "Neural representation for MRI reconstruction" (Spring 2021), BS, CSE, WUSTL
- Yukun Li, "Nonlocal Learning for Image Restoration" (Spring 2020), MS, CSE, WUSTL
- Yongcheng Song, "Fast Automatic Focal Plane Selection for Brightfield Microscopy" (Spring 2020), MS, CSE, WUSTL
- Hao Tang, "Adversarially robust classifiers for image reconstruction" (Fall 2019), "Sinogram2Sinogram for CT" (Spring 2019), BS, CSE, WUSTL
- Weijie Gan, "Fast learning for MRI" (Fall 2018), now is Ph.D, CSE, WUSTL
- Jiarui Xing, "Learning-based MRI" (Fall 2018), now is Ph.D, ECE, UV
- Ryogo Suzuki, "Unfolding image restoration" (Fall 2019), now at Rakuten, Japan

SKILLS

- **Languages:** Python, Matlab, C, Java
- **Skills:** Tensorflow, Pytorch, Deep learning
- **Certifications:** National 3-tier computer certificate (China), National 4-tier computer certificate (Network Engineer, China)

AWARDS

Scholarship

- Graduate Student First-Rank Academic Scholarship 2016
- Graduate Student Second-Rank Academic Scholarship 2015
- Graduate Student First-Rank Academic Scholarship 2014
- National Inspirational Scholarship 2013
- People's First-Rank Scholarship 2012
- National Inspirational Scholarship 2011

Others

- Third-prize of 'Internet+' Entrepreneurship Competition in Sichuan Province 2016
- Great Award of Intelligent City Technology Competition 2016
- Award of Hackathon Programming Competition 2015
- Outstanding Graduate Student 2015
- Second Prize of Electronic Design Competition in UESTC 2011