

# XIAOJIAN XU

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## EDUCATION

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- Washington University in St. Louis (WUSTL)**, St. Louis, MO, USA 9/2017–Present
- Ph.D student in Computer Science, 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
- University of Electronic Science and Technology of China (UESTC)**, Chengdu, China 9/2010–6/2014
- B.Eng in Communication Engineering

## RESEARCH EXPERIENCE

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- 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 MRI reconstruction** 3/2018 – 6/2018
- Implemented a novel convolutional dictionary learning method for MRI reconstruction problems.
  - Compared the performance with traditional patch-wise dictionary learning method and TV based model.
- Some earlier research experience** 3/2014 – 6/2017
- Development of Intelligent Home System.
  - Design and simulation of constrained routing algorithms.
  - Routing and resource scheduling algorithms for large-scale network SDN.

## WORK EXPERIENCE

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- 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 ESE415 Optimization** 1/2019–5/2019  
*Assistant Instructor* St. Louis
- Assistant instructor, teach tutorial sessions, hold office hours, answer questions online, develop tests and solutions, help grading exams and homeworks.
- TA for CSE534A/ESE513 Large-Scale Optimization for Data Science** 9/2019–Present  
*Assistant Instructor* St. Louis
- Assistant instructor, answer questions online and help with the arrangement of courses.
- Student supervision** 7/2018–Present  
*Research Supervisor* St. Louis
- Weijie Gan, "Fast learning for MRI" (Fall 2018 ), Ph.D, CSE, WUSTL
  - Jiarui Xing, "Learning-based MRI" (Fall 2018), Ph.D, ECE, UV
  - Ryogo Suzuki, "unfold Image Restoration" (Fall 2019), Now at Rakuten, Japan

- Hao Tang, "Adversarially robust classifiers for image reconstruction" (Fall 2019), "Sinogram2Sinogram for CT"(Spring 2019), 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

## LIST OF PUBLICATIONS

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### *Preprints*

- **X. Xu**, J. Liu, Y. Sun, B. Wohlberg, and U. S. Kamilov, "Boosting the Performance of Plug-and-Play Priors via Denoiser Scaling, arXiv:2002.11546

### *Conference*

- **X. Xu**, O.Dhifallah, H.Mansour, P.Boufounos, P.Orlik, "Robust 3D Tomographic Imaging of the Ionospheric Electron Density", 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.

### *Journal*

- **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

## SKILLS

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- **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

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### **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