

ACADEMIC POSITION

Johns Hopkins University | Assistant Professor

Baltimore, USA

Electrical and Computer Engineering

2024 - Present

- Joint appointment: Data Science and Artificial Intelligence Institute

EDUCATION AND TRAINING

California Institute of Technology

Pasadena, USA

Postdoctoral Research Associate

2018 - 2022

- Advisor: Prof. Katherine L. Bouman
- Fellowship: Computing, Data, and Society Fellow

Washington University in St Louis

St Louis, USA

Ph.D. in Computer Science

2018 - 2022

- Advisor: Prof. Ulugbek S. Kamilov
- Thesis: “Integrating Physical Models and Deep Priors for Computational Imaging.”
— Turner Dissertation Award 2022 —

Washington University in St. Louis

St Louis, USA

M.S. in Data Analytics & Statistics

2015 - 2017

Sichuan University

Chengdu, China

B.E. in Electronics and Information Engineering

2011 - 2015

- Advisor: Prof. Qinggong Guo

AWARDS AND HONORS

Computing, Data, and Society Fellow

2024

CMS Department, California Institute of Technology

Turner Dissertation Award

2023

CS Department, Washington University in St. Louis

- Top in the class

Honor

2019-2022

CS Department, Washington University in St. Louis

- Top 15% in the class

Student Travel Award

2019

NeurIPS

PUBLICATIONS

Pre-print (* indicates equal contribution)

1. Z. Wu, Y. Sun, Y. Chen, B. Zhang, Y. Yue, and K. L. Bouman “Principled Probabilistic Imaging using Diffusion Models as Plug-and-Play Priors.” **Preprint**.

Journal Publications (* indicates equal contribution)

16. Y. Sun, Z. Wu, Y. Chen, B. T. Feng, and K. L. Bouman “Provable Probabilistic Imaging using Score-Based Generative Priors.” **IEEE Trans. Comput. Imag.**, in press.
15. Z. Wu, T. Yin, Y. Sun, R. Frost, A. V. D. Kouwe, A. V. Dalca, and K. L. Bouman “Learning Task-Specific Strategies for Accelerated MRI.” **IEEE Trans. Comput. Imag.**, vol. 10, pp. 1040-1054, 2024.
14. P. Goyes-Peñafiel, E. Vargas, C. V. Correa, Y. Sun, U. S. Kamilov, B. Wohlberg, and H. Arguello, “Coordinate-Based Seismic Interpolation in Irregular Land Survey: A Deep Internal Learning Approach,” **IEEE Trans. Geo. Rem. Sen.**, vol. 61, pp. 1-12, 2023.

13. R. Liu*, **Y. Sun***, J. Zhu, L. Tian, and U. S. Kamilov, "Recovery of Continuous 3D Refractive Index Maps from Discrete Intensity-Only Measurements using Neural Fields." *Nature Machine Intelligence*, vol. 4, pp. 781–791, 2022. [Impact Factor = 26.4]
12. W. Gan, **Y. Sun**, C. Eldeniz, J. Liu, H. An, and U. S. Kamilov, "Deformation-Compensated Learning for Image Reconstruction without Ground Truth," *IEEE Trans. Med. Imag.*, vol. 41, no. 9, pp. 2371-2384, 2022.
11. **Y. Sun**, J. Liu, M. Xie, B. Wohlberg, and U. S. Kamilov, "CoIL: Coordinate-based Internal Learning for Tomographic Imaging." *IEEE Trans. Comput. Imag.*, vol. 7, pp. 1400-1412, 2021
10. J. Liu, **Y. Sun**, W. Gan, X. Xu, B. Wohlberg, and U. S. Kamilov, "SGD-Net: Efficient Model-Based Deep Learning with Theoretical Guarantees." *IEEE Trans. Comput. Imag.*, vol. 7, pp. 598-610, June 2021
9. **Y. Sun***, Z. Wu*, X. Xu*, B. Wohlberg, and U. S. Kamilov, "Scalable Plug-and-Play ADMM with Convergence Guarantees." *IEEE Trans. Comput. Imag.*, vol. 7, pp. 849-863, July 2021.
8. M. Torop, S. Kothapalli, **Y. Sun**, J. Liu, S. Kahali, D. A. Yablonskiy, and U. S. Kamilov, "Deep learning using a biophysical model for Robust and Accelerated Reconstruction (RoAR) of quantitative and artifact-free R2* images." *Magn. Reson. Med.*, vol. 84, pp. 2932-2942, 2020.
7. X. Xu, **Y. Sun**, J. Liu, B. Wohlberg, and U. S. Kamilov, "Provable Convergence of Plug-and-Play Priors with MMSE denoisers." *IEEE Signal Process. Lett.*, vol. 27, pp. 1280-1284, 2020.
6. G. Song, **Y. Sun**, J. Liu, and U. S. Kamilov, "A New Recurrent Plug-and-Play Prior Based on the Multiple Self-Similarity Network." *IEEE Signal Process. Lett.*, vol. 27, pp. 451-455, 2020.
5. J. Liu, **Y. Sun**, C. Eldeniz, W. Gan, H. An, and U. S. Kamilov, "RARE: Image Reconstruction using Deep Priors Learned without Ground Truth." *IEEE J. Sel. Topics Signal Process.*, vol. 14, no. 6, pp. 1088-1099, 2020.
4. Z. Wu, **Y. Sun**, A. Matlock, J. Liu, L. Tian, and U. S. Kamilov, "SIMBA: Scalable Inversion in Optical Tomography using Deep Denoising Priors." *IEEE J. Sel. Topics Signal Process.*, vol. 14, no. 6, pp. 1163-1175, 2020.
3. **Y. Sun***, J. Liu*, and U. S. Kamilov, "Block Coordinate Regularization by Denoising," *IEEE Trans. Comput. Imag.*, vol. 6, pp. 908-921, 2020.
2. **Y. Sun**, B. Wohlberg, and U. S. Kamilov, "An Online Plug-and-Play Algorithm for Regularized Image Reconstruction." *IEEE Trans. Comput. Imag.*, vol.5, no.3, pp.395-408, September 2019.
1. **Y. Sun**, Z. Xia, and U. S. Kamilov, "Efficient and accurate inversion of multiple scattering with deep learning," *Optics Express*, vol.26, no.11, pp.14678-14688, May 2018.

Conference Publications (* indicates equal contribution)

13. W. Shangguan*, **Y. Sun***, W. Gan, and U. S. Kamilov, "Learning Cross-Video Neural Representations for High-Quality Frame Interpolation." European Conference on Computer Vision (ECCV), Tel Aviv, Israel, October 23-27, pp. 511-528. [Acceptance rate: 1492/5803 = 26%]
12. M. Xie*, J. Liu*, **Y. Sun**, B. Wohlberg, U. S. Kamilov "Joint Reconstruction and Calibration using Regularization by Denoising." Proc. IEEE Int. Conf. Comp. Vis. Workshops (ICCVW 2021), 2021
11. J. Liu, **Y. Sun**, W. Gan, X. Xu, B. Wohlberg, and U. S. Kamilov, "Stochastic Deep Unfolding for Imaging Inverse Problems," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process (ICASSP 2021), Toronto, Canada, June 6-11, pp. 1395-1399.

10. Y. Sun, J. Liu, Y. Sun, B. Wohlberg, and U. S. Kamilov, "ASYNC-RED: A Provably Convergent Asynchronous Block Parallel Stochastic Method using Deep Denoising Priors." International Conference on Learning Representations (ICLR 2021). [Spotlight: 114/2997 = 4%]
9. W. Gan, Y. Sun, C. Eldeniz, H. An and U. S. Kamilov, "Deep Image Reconstruction using Unregistered Measurements without Groundtruth." Proc. Int. Symp. Biomedical Imaging 2021 (ISBI 2021), Nice, France, April 13-16, pp. 1531-1534.
8. X. Xu, J. Liu, Y. Sun, B. Wohlberg, and U. S. Kamilov, "Boosting the Performance of Plug-and-Play Priors via Denoiser Scaling," Proc. 54th Asilomar Conf. Signals, Systems, & Computers (ACSSC 2020), Pacific Grove, CA, November 1-5, pp. 1305-1312.
7. Z. Wu, Y. Sun, J. Liu, and U. S. Kamilov, "Online Regularization by Denoising with Application to Phase Retrieval," Workshop on Learning for Computational Imaging, ICCVW 2019, pp. 3887-3895.
6. J. Liu, Y. Sun, X. Xu, and U. S. Kamilov, "Image Restoration using Total Variation Regularized Deep Image Prior," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2019), pp.7715-7719.
5. J. Liu, Y. Sun, and U. S. Kamilov, "Infusing Learned Priors into Model-Based Multi-spectral Imaging," IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP 2019).
4. Y. Sun, J. Liu, and U. S. Kamilov, "Block Coordinate Regularization by Denoising," Proc. Ann. Conf. Neural Information Processing Systems (NeurIPS 2019), pp. 382-392. [Acceptance rate: 1428/6743 = 21%]
3. Y. Sun, B. Wohlberg, and U. S. Kamilov, "Plug-In Stochastic Gradient Method," Proc. International Biomedical and Astronomical Signal Processing Frontiers Workshop (BASP 2019), p.75.
2. Y. Sun, S. Xu, Y. Li, L. Tian, B. Wohlberg, and U. S. Kamilov, "Regularized Fourier Ptychography using an Online Plug-and-Play Algorithm," Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process. (ICASSP 2019), pp.7665-7669. [Oral]
1. Y. Sun and U. S. Kamilov, "Stability of Scattering Decoder For Nonlinear Diffractive Imaging," Proc. 4th International Traveling Workshop on Interactions between Sparse models and Technology (iTWIST 2018), p.31. [Oral]

INVITED TALKS

ECE Department, Johns Hopkins University Baltimore, U.S.	3/2024
Title: 'Turning Denoisers into Principled Imaging Solvers: Algorithm, Theory, and Application'	
CSE College, Georgia Tech Atlanta, U.S.	3/2024
Title: 'Turning Denoisers into Principled Imaging Solvers: Algorithm, Theory, and Application'	
EI Computational Imaging XXII San Francisco, U.S.	1/2024
Title: 'Provable Probabilistic Imaging using Score-based Generative Priors'	
EI Implicit Neural Representations for Inverse Imaging San Francisco, U.S.	1/2024
Title: 'Implicit Neural Representation for Tomographic Imaging'	
Computational Camera and Display Workshop, CVPR New Orleans, U.S.	7/2022
Title: '3D Tomographic Microscopy using Neural Fields'	
Imaging & vision seminar, Rice University Remote	7/2022
Title: 'Integrating physical and learning models for computational imaging'	
Stanford Computational Imaging Lab Remote	1/2022
Title: 'Integrating physical and learning models for computational imaging'	

Boston University Computational Imaging Systems Lab Remote	12/2021
<i>Title: 'Integrating physical and learning models for computational imaging'</i>	
CMU Image Science Lab Pittsburgh, PA	12/2021
<i>Title: 'Integrating physical and learning models for computational imaging'</i>	
Caltech Computational Cameras Group Remote	10/2021
<i>Title: 'Integrating physical and learning models for computational imaging'</i>	

PRESENTATIONS

ICCP Madison, U.S.	7/2023
<i>Title: 'Provable Probabilistic Imaging using Score-based Generative Priors'</i>	
ECCV Virtual	10/2022
<i>Title: 'Learning Cross-Video Neural Representations for High-Quality Frame Interpolation'</i>	
ICIP Virtual	9/2021
<i>Title: 'SIMBA: Scalable Inversion in Optical Tomography using Deep Denoising Priors'</i>	
ICLR Spotlight, Virtual	10/2021
<i>Title: 'Async-RED: A Provably Convergent Asynchronous Block Parallel Stochastic Method using Deep Denoising Priors'</i>	
NeurIPS Vancouver, Canada	12/2019
<i>Title: 'Block-coordinate Regularization by Denoising'</i>	
iTWIST Marseille, France	11/2018
<i>Title: 'Stability of Scattering Decoder for Nonlinear Diffractive Imaging'</i>	

WORKING EXPERIENCE

Cedars Sinai Hospital Los Angeles, U.S.	8/2022 - 7/2023
• Clinical Data Research Specialist	
Nvidia Inc. Remote, U.S.	5/2021 - 8/2021
• Research Intern.	
Capacity St. Louis, U.S.	5/2017 - 8/2017
• Software Developer Intern	

PROFESSIONAL MEMBERSHIP

Professional Society:	
IEEE Signal Processing Society <i>Member</i>	2022 - <i>present</i>
IEEE Signal Processing Society <i>Student Member</i>	2018 - 2022
Technical Committee:	
IEEE SPS Computational Imaging Technical Committee <i>Member</i>	2022 - <i>present</i>

ACADEMIC SERVICES

Organizers for:	
ICASSP Special Session	2025
<i>Title: 'Computational Imaging in the Age of Generative AI'</i>	
Journal Editors for:	
IEEE Open Journal of Signal Processing	2022 - <i>present</i>
<i>Consultant Associate Editor</i>	
Journal Reviewers for:	
Nature Communications (Nat. Commun)	
OSA Optica	
SIAM Journal on Imaging Sciences (SIIMS)	

IEEE Transaction on Pattern Analysis and Machine Intelligence (TPAMI)
 IEEE Journal of Selected Topics in Signal Processing (JSTSP)
 IEEE Transaction on Computational Imaging (TCI)
 IEEE Transaction on Signal Processing (TSP)
 IEEE Transaction on Image Processing (TIP)
 IEEE Signal Processing Letters (SPL)
 Signal Processing (SP)
 Applied Mathematics and Computation (AMC)
 Digital Signal Process (DSP)
 SPIE Journal on Electronic Imaging (JEI)

Conference Reviewer/PCs for:

International Conference on Learning Representations (ICLR)
 International Conference on Machine Learning (ICML)
 Neural Information Processing Systems (NeurIPS)
 Computer Vision and Pattern Recognition (CVPR)
 European Conference on Computer Vision (ECCV)
 International Joint Conference on Artificial Intelligence (IJCAI)
 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)

TEACHING

Washington University in St. Louis (As Teaching Assistant):

Sparse Model for Imaging, CSE 585T. Fall 2018.
Optimization, ESE 415. Fall 2018, Spring 2019, Spring 2020.
Cloud Computing and Big Application, CSE 427S. Fall 2016, Spring 2017, Fall 2017.

MENTORSHIP

California Institute of Technology (Co-advised with Prof. Bouman):

Zihui Wu (Ph.D. CMS)
 Heriniaina Rajaoberison (Ph.D. CMS)

Washington University in St. Louis (Co-advised with Prof. Kamilov):

Wentao Shanguan (M.S. CSE, 2022)	Now Ph.D. student at Boston U.
Renhao Liu (B.S./M.S. CSE, 2022)	Now at Google Inc.
Mingyang Xie (B.S. CSE, 2021)	Now Ph.D. at U. Maryland
Yiran Sun (M.S. CSE, 2021)	Now Ph.D. at Rice U.
Weijie Gan (M.S. CSE, 2020)	Now Ph.D. at Wash U.
Zihui Wu (B.S. CSE, 2020)	Now Ph.D. at Caltech
Max Torop (M.S. CSE, 2020)	Now Ph.D. at Northeastern U.
Shiqi Xu (M.S. ESE, 2019)	Now Ph.D. at Duke U.
Jiaming Liu (M.S. ESE, 2018)	Ph.D. at Wash. U, Postdoc at Stanford U.
Zach Pewitt (M.S. ESE, 2018)	Now at Boeing
Joseph Han (M.S. ESE 2018)	Now at Deloitte
Jialong Zhang (M.S. ESE, 2018)	Now at Schlumberger
Fangying Zhai (M.S. ESE, 2018)	Now at Google Inc.
Chunyuan Li (M.S. CSE, 2018)	