Yu Sun Ph.D.

: https://hcig.wse.jhu.edu/
3400 N Charles St, Barton Hall 214, Baltimore, MD 21218
Curriculum Vitae (Sep. 2025)

Academic Position

Johns Hopkins University, ***Assistant Professor*** — Baltimore, USA
Department of Electrical and Computer Engineering — 2024 - *Present*

- Affiliation: Data Science and Artificial Intelligence Institute (DSAI)
  Center of Imaging Science (CIS)
  Mathematical Institute for Data Science (MINDS)

Education and Training

California Institute of Technology — Pasadena, USA
Postdoctoral Research Associate — 2022 - 2024

- 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

Working Experience

Cedars Sinai Hospital | Los Angeles, U.S. — 8/2022 - 7/2023
Clinical Data Research Specialist

- Host: Dr. David Ouyang

Nvidia Inc. | Remote, U.S. — 5/2021 - 8/2021
Research Intern

- Host: Dr. Orazio Gallo

Capacity | St. Louis, U.S. — 5/2017 - 8/2017
Software Developer Intern

Awards and Honors

Rising Star Award — 2025
Conference on Parsimony and Learning

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

Professional Membership

Professional Society:

IEEE Signal Processing Society, ***Member*** 2022 - *present*

IEEE Signal Processing Society, ***Student Member*** 2018 - *2022*

Technical Committee:

IEEE SPS Computational Imaging Technical Committee, ***Member*** 2022 - *present*

Publications

Pre-prints ('∗' indicates equal contribution)

4. J. Alido, T. Li, **Y. Sun**, and L. Tian, "Whitened Score Diffusion: A Structured Prior for Imaging Inverse Problems." Pre-print, arXiv:2505.10311, 2025.

3. Y. Wang, V. R. Shi, L. Zhou, R. Chin, Y. Dai, Y. Hu, C. Li, H. Guan, J. Cheng, **Y. Sun**, C. T. Lin, I. Kamel, P. Trivedi, P. Johnson, J. Eng, H. Bai, "Dataset and Benchmark for Enhancing Critical Retained Foreign Object Detection." Pre-print, arXiv:2507.06937, 2025.

2. J. Alido, T. Li, **Y. Sun**, and L. Tian, "Whitened Score Diffusion: A Structured Prior for Imaging Inverse Problems." Pre-print, arXiv:2505.10311, 2025.

1. Y. Wang, J. Yu, W. Guo, **Y. Sun**, J. U. Kang, "Super-Resolution Optical Coherence Tomography Using Diffusion Model-Based Plug-and-Play Priors." Technical Report, arXiv:2505.14916, 2025

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.**, vol. 10, pp. 1290-1305, 2024.
⋆ **Poster presentation at the Int. Conf. Comput. Photo. (ICCP 2023) and Conf. Parsi. Learn. (CPAL 2025).**

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.
⋆ **High-impact journal [5-Year 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.
   ⋆ **Poster presentation at the Int. Conf. Image Proces. (ICIP 2021).**

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, 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, 2018.

Conference Publications ('∗' indicates equal contribution)

19. Y. Wang, H. Jung, D. Peng, Y. Dai, J. Wu, H. Guan, Y. Kato, Z. Jiao, **Y. Sun**, I. Kamel, J. Lima, C. T. Lin, and H. Bai, "Self-Supervised Contrastive Learning for Cardiac MR Sequence Classification." MICCAI 2025 Workshop on Multimodal Learning and Fusion Across Scales for Clinical Decision Support (**ML-CDS 2025**), in press.

18. Y. Gao, W. Guo, and **Y. Sun**, "Neural Inverse Scattering with Score-Based Regularization." Proc. IEEE Conf. Comput. Imaging using Synthetic Apertures (**CISA 2025**), in press.
   ⋆ **Oral presentation**.

17. H. Zheng, W. Chu, B. Zhang, Z. Wu, A. Wang, B. Feng, C. Zou, **Y. Sun**, N. B. Kovachki, Z. E Ross, K. Bouman, and Y. Yue, "InverseBench: Benchmarking Plug-and-Play Diffusion Models for Scientific Inverse Problems." Proc. Int. Conf. Learning Representation (**ICLR 2025**), in press.
   ⋆ **Spotlight presentation [Acceptance Rate: 587/11500 = 5.1%]**.

16. 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." Adv. in Neural Information Processing Systems (**NeurIPS 2024**), pp. 118389-118427, Vancouver, Canada, Dec. 10-15.
   ⋆ **Poster presentation [Acceptance Rate: 4043/15671 = 25.8%]**.

15. W. Shangguan*, **Y. Sun***, W. Gan, and U. S. Kamilov, "Learning Cross-Video Neural Representations for High-Quality Frame Interpolation." Proc. European Conference on Computer Vision (**ECCV 2022**), pp. 511-528, Tel Aviv, Israel, October 23-27.
   ⋆ **Poster presentation [Acceptance rate: 1492/5803 = 26%]**.

14. M. Xie*, J. Liu*, **Y. Sun**, B. Wohlberg, U. S. Kamilov, "Joint Reconstruction and Calibration using Regularization by Denoising." Proc. IEEE/CVF Int. Conf. Computer Vision Workshops (**ICCVW 2021**), October 11-17.

13. 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**), pp. 1395-1399, Toronto, Canada, June 6-11.

12. W. Gan, **Y. Sun**, C. Eldeniz, J. Liu, H. An, and U. S. Kamilov, "Deep Image Reconstruction for MRI using Unregistered Measurement Pairs without Ground Truth," Proc. Int. Soc. of Magnetic Resonance in Medicine (**ISMRM 2021**), p. 1959, May 15-20.

11. **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." Proc. Int. Conf. Learning Representation (**ICLR 2021**), Vienna, Austria, May 4-8.
    ⋆ **Spotlight presentation [Acceptance Rate: 114/2997 = 4%]**.

10. 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**), pp. 1531-1534, Nice, France, April 13-16.

9. 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**), pp. 1305-1312, Pacific Grove, CA, November 1–5.

8. J. Liu, C. Eldeniz, **Y. Sun**, W. Gan, S. Chen, H. An, and U. S. Kamilov, "RED-N2N: Image Reconstruction for MRI using Deep CNN Priors Trained without Ground Truth," Proc. Int. Soc. of Magnetic Resonance in Medicine (**ISMRM 2020**), p. 993, August 8-14.

7. J. Liu, **Y. Sun**, and U. S. Kamilov, "Infusing Learned Priors into Model-Based Multispectral Imaging," IEEE Int. Workshop on Computational Advances in Multi-Sensor Adaptive Processing (**CAMSAP 2019**), Guadeloupe, France, December 15-18.

6. **Y. Sun**, J. Liu, and U. S. Kamilov, "Block Coordinate Regularization by Denoising," Adv. in Neural Information Processing Systems (**NeurIPS 2019**), pp. 382-392, Vancouver, Canada, Dec 8-14.
    ⋆ **Poster presentation [Acceptance Rate: 1428/6743 = 21%]**.

5. Z. Wu, **Y. Sun**, J. Liu, and U. S. Kamilov, "Online Regularization by Denoising with Application to Phase Retrieval," Proc. IEEE/CVF Int. Conf. Computer Vision Workshops (**ICCVW 2019**), pp. 3887-3895, Seoul, Korea, October 27-November 2.

4. 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, Brighton, UK, May 12-17.

3. **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, Brighton, UK, May 12-17.
    ⋆ **Oral presentation**.

2. **Y. Sun**, B. Wohlberg, and U. S. Kamilov, "Plug-In Stochastic Gradient Method," Proc. Int. Biomedical and Astronomical Signal Processing Frontiers Workshop (**BASP 2019**), p.75, Villars-sur-Ollon, Switzerland, February 3-8.

1. **Y. Sun** and U. S. Kamilov, "Stability of Scattering Decoder For Nonlinear Diffractive Imaging," Proc. 4th Int. Traveling Workshop on Interactions between Sparse models and Technology (**iTWIST 2018**), p.31, Marseille, France, November 21-23.
    ⋆ **Oral presentation**.

Invited Talks

Conference, Workshop & Seminar Talks:

Rising Star Presentation, CPAL | Palo Alto, U.S. 3/2025
Invited by *CPAL Program Committee*

Deep Reconstruction Workshop | Baltimore, U.S. 3/2025
Invited by *Prof. Webster Stayman*

F.M. Kirby Center Seminar, Johns Hopkins University | Baltimore, U.S. 1/2025
Invited by *Prof. Hanzhang Lu*

Imaging Seminar, Purdue University | West Lafayette, U.S. 10/2024
Invited by *Prof. Stanly Chan*

MINDS Seminar, Johns Hopkins University | Baltimore, U.S. 10/2024
Invited by *Prof. Rama Chellappa*

ECE Seminar, Johns Hopkins University | Baltimore, U.S. 10/2024
Invited by *Prof. Sijia Geng*

Computational Imaging Workshop, IMSI, UChicago | Chicago, U.S. 8/2024
Invited by *Prof. Ulugbek Kamilov*

SIAM Conference on Imaging Science | Atlanta, U.S. 5/2024
Invited by *Prof. Wenjing Liao, Prof. Ju Sun, Prof. Zhizhen Zhao*

ECE Seminar, Johns Hopkins University | Baltimore, U.S. 3/2024
Invited by *Prof. Pablo Iglesias*

CSE College Seminar, Georgia Tech | Atlanta, U.S. 3/2024
Invited by *Prof. Duen Horng Chau*

EI Computational Imaging XXII | San Francisco, U.S. 1/2024
Invited by *Prof. Charles Bouman*

EI Implicit Neural Representations for Inverse Imaging | San Francisco, U.S. 1/2024
Invited by *Dr. Aditya Mohan*

Computational Camera and Display Workshop, CVPR | New Orleans, U.S. 7/2022
Invited by *Prof. Emma Alexander*

Imaging & Vision Seminar, Rice University | Remote 7/2022
Invited by *Dr. Dushyant Mehra*

Research Group Talks:

Yi Lab | Johns Hopkins University 11/2024
Invited by *Prof. Ji Yi*

AI for Engineering and Medicine Lab | Johns Hopkins University 10/2024
Invited by *Prof. Rama Chellappa*

Fazlyab Lab | Johns Hopkins University 10/2024
Invited by *Prof. Mahyar Fazlyab*

Computational Biophotonics Lab | Johns Hopkins University 10/2024
Invited by *Prof. Nick Durr*

Biophotonics Imaging Technology Lab | Johns Hopkins University 10/2024
Invited by *Prof. Xingde Li*

Intelligence Optical Imaging and Vision Lab | Johns Hopkins University 10/2024
Invited by *Prof. Jin Kang*

Signals, Learning, and Imaging Research Group | Michigan State University 9/2024
Invited by *Prof. Sai Ravishankar*

Stanford Computational Imaging Lab | Stanford University 1/2022
Invited by *Prof. Gordon Wetzstein*

Computational Imaging Systems Lab | Boston University 12/2021
Invited by *Prof. Lei Tian*

Image Science Lab | Carnegie Mellon University 12/2021
Invited by *Prof. Aswin Sankaranarayanan*

Computational Cameras Group | California Institute of Technology 10/2021
Invited by *Prof. Katie Bouman*

Academic Services

Organizers for:

IEEE Computational Imaging Using Synthetic Apertures (CISA) | Albany, NY 2026
Chair of the Technical Committee

IEEE ICASSP, Special Session | Hyderabad, India 2025
Theme: 'Computational Imaging in the Age of Generative AI'

Journal Editors for:

IEEE Open Journal of Signal Processing, ***Consultant Associate Editor*** 2022 - *present*

Special Issue of Journal of Mathematical Imaging and Vision, ***Guest Editor*** 2025

Journal Reviewers for:

Nature Communications (**Nat. Commun**)

OSA **Optica**

Biophysical Journal (**BJ**)

IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**)

IEEE Journal of Selected Topics in Signal Processing (**JSTSP**)

IEEE Transactions on Computational Imaging (**TCI**)

IEEE Transactions on Medical Imaging (**TMI**)

IEEE Transactions on Signal Processing (**TSP**)

IEEE Transactions on Image Processing (**TIP**)

IEEE Signal Processing Letters (**SPL**)

SIAM Journal on Imaging Sciences (**SIIMS**)

SIAM Journal on Scientific Computing (**SISC**)

Signal Processing (**SP**)

Applied Mathematics and Computation (**AMC**)

Digital Signal Process (**DSP**)

SPIE Journal on Electronic Imaging (**JEI**)

Conference Area Chairs for:

IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**)

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 Conference on Computational Photography (**ICCP**)

International Joint Conference on Artificial Intelligence (**IJCAI**)

IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**)

IEEE International Symposium on Biomedical Imaging (**ISBI**)

University Service

Committees:

JHU ECE Graduate Student Committee 2024-*Present*

Doctoral/Graduate Board Oral Exams:

Esther Whang, BME Department 5/2025
Title: "Fast Two-photon Microscopy by Neuroimaging with Oblong Random Acquisition"

Aniket Roy, CS Department 12/2024
Title: "Learning More from Less: Resource-Constrained Generative AI for Classification, Generation, and Personalization"

Doctoral Thesis Committee:

Linh Hoang, BME Department, Johns Hopkins University 08/2025
In progress: Proposal made.

Jeffrey Alido, ECE Department, Boston University 06/2025
Title: "Deep Learning Approaches for Imaging Inverse Problems with Structured Noise"

Teaching

Johns Hopkins University:

Computational Imaging, EN.520.458/658. Spring 2025, Fall 2025.

Previously Taught at 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

Postdoctoral Researcher:

Deliang Wei (Ph.D. from ECNU, 2025-present)

Ph.D. Students:

Evan Bell (Ph.D. ECE, 2025-present)

Wenhan Guo (Ph.D. ECE, 2025-present)

M.S./B.S. Students:

Haoyue Guan (M.S. CS, 2025-present)

Yetao He (M.S. BME, 2025-present)

Yuan Gao (M.S. HSI, 2024-present)

Yuanyun Hu (M.S. BME, 2024-2025) *Now M.S. student at Tsinghua U.*

Guannan He (M.S. ECE, 2024-2025) *Now Ph.D. student at Wake Forest U.*

Xinmin Shen (B.S. AMS, 2024)

Xinyao Shao (M.S. ECE, 2024)

Bingyan Liang (M.S. DS, 2024, University of Wisconsin-Madison)

Previous Students at California Institute of Technology (*Co-advised with Prof. Bouman*):

Zihui Wu (Ph.D. CMS, 2022-2024) *Now at Jump Trading*

Heriniaina Rajaoberison (M.S. CMS, 2022-2024)

Zijun Deng (B.S. CMS, 2023-2024) *Now Ph.D. student at Georgia Tech*

Previous Students at Washington University in St. Louis (*Co-advised with Prof. Kamilov*):

Wentao Shangguan (M.S. CSE, 2021-2022) *Now Ph.D. student at Boston U.*

Renhao Liu (B.S./M.S. CSE, 2021-2022) *Now at Google Inc.*

Mingyang Xie (B.S. CSE, 2019-2021) *Now Ph.D. at U. Maryland*

Yiran Sun (M.S. CSE, 2021) *Now Ph.D. at Rice U.*

Weijie Gan (M.S. CSE, 2019-2021) *Now Ph.D. at Wash U.*

Zihui Wu (B.S. CSE, 2018-2020) *Now Ph.D. at Caltech*

Max Torop (M.S. CSE, 2019-2020) *Now Ph.D. at Northeastern U.*

Shiqi Xu (M.S. ESE, 2018-2019) *Now Ph.D. at Duke U.*

Jiaming Liu (M.S. ESE, 2018-2019) *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)