M. Salman Asif

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Research Interests

- Machine learning and structured information representation
- Multimodal machine learning
- Continual and parameter-efficient learning
- Trustworthy, robust, and adversarial machine learning and computer vision
- Computational imaging and sensing
- Learning-based methods for solving inverse problems

Professional Experience

University of California (UC) Riverside — *Associate Professor*
Riverside, California — July 2022 – Present

Assistant Professor
July 2016 – June 2022

Amazon Lab 126 — *Consultant and Visiting Faculty*
Sunnyvale, CA — November 2023 – Present

Air Force Research Laboratory — *Visiting Research Faculty*
Rome, New York — Summer 2018, 2019, 2020, 2021

Rice University — *Postdoctoral Research Associate*
Houston, Texas — February 2014 – June 2016

Samsung Research America — *Senior Research Engineer*
Richardson, Texas — August 2012 – January 2014

Georgia Institute of Technology — *Graduate Research Assistant*
Atlanta, Georgia — January 2007 – August 2012

Samsung Research America — *Research Intern*
Richardson, Texas — May 2010 – August 2010

Mitsubishi Electric Research Laboratories — *Research Intern*
Cambridge, Massachusetts — May 2009 – August 2009

University of Engineering and Technology — *Lecturer*
Lahore, Pakistan — January 2005 – August 2006

Education

Georgia Institute of Technology, Atlanta, Georgia
Ph.D. in Electrical and Computer Engineering — August 2013
M.S. in Electrical and Computer Engineering — August 2008

University of Engineering & Technology, Lahore, Pakistan
B.Sc. in Electrical Engineering (*with Honors*) — December 2004

Honors and Awards

- National Science Foundation (NSF) CAREER Award — 2021
- UC Regents' Faculty Development Award — 2021
- Google Faculty Research Award — 2019
- AFRL Visiting Research Faculty Fellowship — 2018, 2019, 2020, 2021
- UC Regents' Faculty Fellowship Award — 2017
- Hershel M. Rich Outstanding Invention Award, Rice University — 2016

Research Support

G15. Project: SCH: Collaborative Research: Comprehensive Tissue Disease Diagnosis Using a Multimodal Robotic System (co-PI)
Funding agency: National Science Foundation (NSF)
Project period: October 2024 – September 2028

G14. Project: DISCO: Discovery of Sparsity-Constrained Optimization Algorithms (co-PI)
Funding agency: DARPA DIAL Program
Project period: July 2024 – July 2026

G13. Project: M^3 Networks: Multimodal, Multitask, and Multipath Networks (PI)
Funding agency: Amazon
Project period: September 2023 – August 2024

G12. Project: Ensemble-based Robust Models for Computer Vision (PI)
Funding agency: SoCal Hub
Project period: October 2023 – September 2025

G11. Project: Vision-Guided Flexible Robots for Harvesting the Interior of Tree Crops (co-PI)
Funding agency: United States Department of Agriculture (USDA)
Project period: October 2023 – September 2025

G10. Project: CAREER: Optimized Sensing and Recovery for Computational Imaging (single PI)
Funding agency: National Science Foundation (NSF)
Project period: February 2021 – January 2026

G9. Project: Integrated Sensing and Learning with Multi-Modal Sensors (single PI)
Funding Agency: Air Force Office of Scientific Research
Project Period: July 2021 – June 2024

G8. Project: NRI: Integrated Soft Wearable Robotics Technology to Assist Arm Movement of Infants with Physical Impairments (co-PI)
Funding Agency: National Science Foundation (NSF)
Project Period: December 2021 – November 2025

G7. Project: Intelligent and Adaptive Multi-Modal Sensing (UC Regents Faculty Development Award, single PI)
Funding Agency: UC Riverside Senate
Project Period: July 2021 – June 2023

G6. Project: Holistic Visual Attacks (co-PI)
Funding agency: DARPA AIE TMVD Program
Project period: July 2020 – December 2021

G5. Project: Integrated Perception and Planning in Resilient, Multi-Modal, Multi-Agent Networks (co-PI)
Funding agency: Office of Naval Research (ONR)
Project period: April 2019 – March 2023

G4. Project: Distributed and Data-Driven Lensless Imaging (Google Faculty Award, single PI)
Funding Agency: Google Inc.
Project period: March 2019 – March 2020

G3. Project: Development of computational cameras in display (single PI)
Funding agency: Samsung Electronics
Project period: February 2019 – December 2019

G2. Project: Obtaining Multipath and Non-line-of-sight Information by Sensing Coherence and Intensity with Emerging Novel Techniques (OMNISCIENT) (co-PI, prime is SMU)
Funding agency: DARPA REVEAL Program
Project period: May 2018 – July 2020

G1. Project: Computational Imaging: Sensing the World Under Constraints (UC Regents' Faculty Fellowship Award, single PI)
Funding agency: UC Riverside Senate
Project period: August 2017 – August 2018

Publications

A complete list of my publications can be found at
Google Scholar profile: http://bit.ly/salmanasif
Google scholar metrics (October 2024): 2951 citations, H-index = 29, i10-index = 53

Journal Publications

J30. M. Reza, A. Prater-Bennette, M. Asif. "Robust Multimodal Learning with Missing Modalities via Parameter-Efficient Adaptation," *accepted* in *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 2024. [available online arXiv:2310.03986]

J29. S. Urrea, R. Jacome, M. Asif, H. Arguello and H. Garcia, "DoDo: Double DOE Optical System for Multishot Spectral Imaging," in *IEEE Journal of Selected Topics in Signal Processing*, 2024. doi:10.1109/JSTSP.2024.3402320

J28. M. Reza, A. Prater-Bennette, M. Asif. "Multimodal Transformer for Material Segmentation," *IEEE Open Journal of Signal Processing* 2024. [available online arXiv:2309.04001]

J27. N. Yismaw, U. Kamilov, and M. Asif, "Domain Expansion via Network Adaptation for Solving Inverse Problems," *IEEE Trans. on Computational Imaging*, vol 10, pp. 549–559, 2024. doi: 10.1109/TCI.2024.3377101 [available online arxiv:2310.06235]

J26. Z. Li, M. Lu, X. Zhang, X. Feng, M. Asif, and Z. Ma, "Efficient Visual Computing with Camera RAW Snapshots," *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 2024. doi: 10.1109/TPAMI.2024.3359326.

J25. Y. Zheng and M. Asif, "Coded Illumination for Improved Lensless Imaging," *IEEE Trans. on Computational Imaging*, vol 9, pp. 172–184, 2023. doi:10.1109/TCI.2023.3234898 [available online arXiv:2111.12862]

J24. R. Anirudh et al. "2022 Review of Data-Driven Plasma Science." *IEEE Transactions on Plasma Science*, vol 51, no. 7, pp. 1750–1838, 2023. doi:10.1109/TPS.2023.3268170

J23. Y. Xu, D. Xu, N. Yu, B. Liang, Z. Yang, M. Asif, R. Yan, and M. Liu. "Machine Learning Enhanced Optical Microscopy for the Rapid Morphology Characterization of Silver Nanoparticles." ACS Applied Materials & Interfaces, 2023. doi:10.1021/acsami.3c02448

J22. Y. Hua, M. Asif, and A. Sankaranarayanan, "Spatial and Axial Resolution Limits for Mask-based Lensless Cameras," *Optics Express*, vol. 31, pp. 2538–2551, 2023. doi:10.1364/OE.480025

J21. A. Masoumian, H. Rashwan, S. Abdulwahab, J. Cristiano, M. Asif, and D. Puig, "GCN-Depth: Self-supervised monocular depth estimation based on graph convolutional network," *Neurocomputing*, vol 517, pp. 81–92, 2023. doi:10.1016/j.neucom.2022.10.073

J20. Y. Zheng and M. Asif, "Coded Illumination for 3D Lensless Imaging," *IEEE Open Journal of Signal Processing*, vol. 3, pp. 432–439, 2022. doi:10.1109/OJSP.2022.3231180

J19. R. Hyder, Z. Cai, and M. Asif, "Learning to Sense for Coded Diffraction Imaging." *Sensors* 22(24), 9964; 2022. doi:10.3390/s22249964

J18. M. Cheng, Y. Xu, W. Shen, M. Asif, C. Ma, J. Sun, and Z. Ma, "H2-Stereo: High-Speed, High-Resolution Stereoscopic Video System," in *IEEE Trans. on Broadcasting*, vol. 68, no. 4, pp. 886–903, 2022. [available online arXiv:2208.02436]

J17. A. Masoumian, H. Rashwan, J. Cristiano, M. Asif, and D. Puig, "Monocular Depth Estimation Using Deep Learning: A Review." *Sensors* 22(14), 5353; 2022. doi:10.3390/s22145353

J16. P. Guo, M. S. Asif and Z. Ma, "Low-Light Color Imaging Via Cross-Camera Synthesis," in *IEEE Journal of Selected Topics in Signal Processing*, vol. 16, no. 4, pp. 828–842, 2022. doi:10.1109/JSTSP.2022.3175015.

J15. B. Liang, D. Xu, N. Yu, Y. Xu, X. Ma, Q. Liu, M. Asif, R. Yan, and Ming Liu. "Physics-Guided Neural-Network-Based Inverse Design of a Photonic–Plasmonic Nanodevice for Superfocusing." in *ACS Applied Materials & Interfaces*, vol 14, no. 23, pp. 27397—27404, 2022.

J14. W. Shen, M. Cheng, G. Lu, G. Zhai, L. Chen, M. Asif, and Z. Gao, "Spatial Temporal Video Enhancement Using Alternating Exposures," in *IEEE Trans. on Circuits and Systems for Video Technology*, vol. 32, no. 8, pp. 4912–4926, 2022.

J13. A. Akrami, M. Asif, and H. Mohsenian-Rad, "Sparse Tracking State Estimation for Low-Observable Power Distribution Systems Using D-PMUs, " in *IEEE Trans. on Power Systems*, vol 37, no. 1, pp. 551–564, 2022.

J12. M. Cheng, Z. Ma, M. Asif, Y. Xu, H. Liu, W. Bao, and J. Sun, "A Dual Camera System for High Spatiotemporal Resolution Video Acquisition," in *IEEE Trans. on Pattern Analysis and Machine Intelligence*, vol. 43, no. 10, pp. 3275-3291, 2021.

J11. B. Muminov, A. Perry, R. Hyder, M. Asif, and L. Vuong. "Toward simple, generalizable neural networks with universal training for low-SWaP hybrid vision." *Photonics Research*, 9 (7), pp. B253–B261, 2021.

J10. Y. Zheng and M. Asif, " Joint image and depth estimation with mask-based lensless cameras," in *IEEE Trans. on Computational Imaging*, vol. 6, pp. 1167-1178, 2020 [available online arXiv:1910.02526].

J9. R. Hyder and M. Asif, "Generative models for low-rank video representation and reconstruction," in *IEEE Trans. on Signal Processing*, vol. 68, pp. 1688–1701, 2020.

J8. Y. Hua, S. Nakamura, M. Asif, and A. Sankaranarayanan,"SweepCam—Depth-aware Lensless Imaging using Programmable Masks," in *IEEE Transactions on Pattern Analysis & Machine Intelligence*, vol. 42, no. 7, pp. 1606-1617, 2020.

J7. M. Asif, A. Ayremlou, A. Sankaranarayanan, A. Veeraraghavan, and R. Baraniuk, "FlatCam: Thin, bare-sensor cameras using coded aperture and computation," *IEEE Trans. on Computational Imaging*, 3 (3) pp. 384 – 397, September 2017.

J6. V. Boominathan, J. Adams, M. Asif, B. Avants, J. Robinson, R. Baraniuk, A. Sankaranarayanan, and A. Veeraraghavan, "Lensless Imaging: A computational renaissance," *IEEE Signal Processing Magazine*, 33 (5), pp. 23–35, September 2016.

J5. J. Holloway, M. Asif, M. Sharma, N. Matsuda, R. Horstmeyer, O. Cossairt, and A. Veeraraghavan, "Toward long distance, sub-diffraction imaging using coherent camera arrays," *IEEE Trans. on Computational Imaging*, 2 (3) pp. 251–265, September 2016.

J4. M. Asif and J. Romberg, "Sparse recovery of streaming signals using ℓ_1-homotopy," *IEEE Trans. on Signal Processing*, 62 (16) pp. 4209–4223, August 2014.

J3. M. Asif and J. Romberg, "Fast and accurate algorithms for reweighted ℓ_1-norm minimization," *IEEE Trans. on Signal Processing*, 61 (2) pp. 5905–5916, December 2013.

J2. M. Asif, L. Hamilton, M. Brummer, and J. Romberg, "Motion-adaptive spatio-temporal regularization (MASTeR) for accelerated dynamic MRI," *Magnetic Resonance in Medicine*, 70(3) pp. 800–812, September 2013.

J1. M. Asif and J. Romberg, "Dynamic updating for ℓ_1 minimization," *IEEE Journal of Selected Topics in Signal Processing*, 4(2) pp. 421–434, April 2010.

Conference Proceedings

Papers in ML/CV Conferences
(double-blind, two-stage peer review, 6+ pages long papers)

H22. T. Chakraborty, E. Shayegani, Z. Cai, N. Abu-Ghazaleh, M. Asif, Y. Dong, A. Roy-Chowdhury, and C. Song, "Cross-Modal Safety Alignment: Is textual unlearning all you need?," *EMNLP Findings*, 2024. [available online arXiv:2406.02575]

H21. B. Jiang, B. Xiong, B. Qu, M. Asif, Y. Zhou, and Z. Ma, "EDformer: Transformer-Based Event Denoising Across Varied Noise Levels," in *European Conference on Computer Vision (ECCV)*, 2024.

H20. S. Shoushtari, J. Liu, E. Chandler, M. Asif, U. Kamilov. "Prior Mismatch and Adaptation in PnP-ADMM with a Nonconvex Convergence Analysis," in *International Conference on Machine Learning (ICML)*, July 2024. [available online arXiv:2310.00133]

H19. Q. Zhao, M. Asif, and Z. Ma, "PNeRV: Enhancing Spatial Consistency via Pyramidal Neural Representation for Videos," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2024.

H18. Z. Cai, Z. Gao, B. Planche, M. Zheng, T. Chen, M. Asif, Z. Wu, "Disguise without Disruption: Utility-Preserving Face De-Identification," *AAAI Conference on Artificial Intelligence*, February 2024. [available online arXiv:2303.13269]

H17. Z. Cai, Y. Tan, and M. Asif, "Ensemble-based Blackbox Attacks on Dense Prediction," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2023.

H16. Q. Zhao, M. Asif, and Z. Ma, "DNeRV: Modeling Inherent Dynamics via Difference Neural Representation for Videos," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2023.

H15. A. Aich, S. Li, C. Song, M. Asif, S. Krishnamurthy, and A. Roy-Chowdhury, "Leveraging Local Patch Differences in Multi-Object Scenes for Generative Adversarial Attacks," *Winter Conference on Applications of Computer Vision (WACV)*, January 2023. [available online arXiv:2209.09883]

H14. Z. Cai, C. Song, S. Krishnamurthy, A. Roy-Chowdhury, and M. Asif, "Blackbox Attacks via Surrogate Ensemble Search," *Conference on Neural Information Processing Systems (NeurIPS)*, December 2022. [available online arXiv:2208.03610]

H13. A. Aich, C. Khang-Ta, A. Gupta, C. Song, S. Krishnamurthy, M. Asif, and A. Roy-Chowdhury, "GAMA: Generative Adversarial Multi-Object Scene Attacks," *Conf. on Neural Information Processing Systems (NeurIPS)*, December 2022. [available online arXiv:2209.09502]

H12. R. Hyder, K. Shao, B. Hou, P. Markopoulos, A. Prater-Bennette, and M. Asif, "Incremental Task Learning with Incremental Rank Updates," *European Conference on Computer Vision (ECCV)*, 2022. [available online arXiv:2207.09074]

H11. Z. Cai, S. Rane, A. Brito, C. Song, S. Krishnamurthy, A. Roy-Chowdhury, and M. Asif, "Zero-Query Transfer Attacks on Context-Aware Object Detectors," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2022, pp. 15024-15034 [available online arXiv:2203.15230]

H10. Z. Cai, X. Xie, S. Li, M. Yin, C. Song, S. Krishnamurthy, A. Roy-Chowdhury, and M. Asif, "Context-Aware Transfer Attacks for Object Detection," *AAAI Conference on Artificial Intelligence*, February 2022. [available online arXiv:2112.03223]

H9. M. Yin, S. Li, C. Song, M. Asif, A. Roy-Chowdhury, and S. Krishnamurthy, "ADC: Adversarial attacks against object Detection that evade Context consistency checks," in *Proc. Winter Conference on Applications of Computer Vision (WACV)*, January 2022.

H8. J. Liu, M. Asif, B. Wohlberg, and U. Kamilov, "Recovery Analysis for Plug-and-Play Priors using the Restricted Eigenvalue Condition," in *Proc. Conference on Neural Information Processing Systems (NeurIPS)*, December 2021. [available online arXiv:2106.03668]

H7. S. Li, A. Aich, S. Zhu, M. Asif, C. Song, A. Roy-Chowdhury, and S. Krishnamurthy,"Adversarial Attacks on Black Box Video Classifiers: Leveraging the Power of Geometric Transformations," in *Proc. Conference on Neural Information Processing Systems (NeurIPS)*, December 2021. [available online arXiv:2110.01823]

H6. Y. Zheng, Y. Hua, A. Sankarnarayanan, and M. Asif, "A Simple Framework for 3D Lensless Imaging with Programmable Masks," in *Proc. International Conference on Computer Vision (ICCV)*, October 2021.

H5. M. Yin, S. Li, Z. Cai, C. Song, M. Asif, A. Roy-Chowdhury, and S. Krishnamurthy, "Exploiting Multi-Object Relationships for Detecting Adversarial Attacks in Complex Scenes," in *Proc. International Conference on Computer Vision (ICCV)*, October 2021.

H4. Z. Pu, P. Guo, M. Asif, and Z. Ma, "Robust High Dynamic Range (HDR) Imaging with Complex Motion and Parallax," in *Asian Conference on Computer Vision (ACCV)*, December 2020.

H3. R. Hyder, Z. Cai, and M. Asif, " Solving Phase Retrieval with a Learned Reference, " in *Proc. European Conference on Computer Vision (ECCV)*, August 2020.

H2. A. Aich, A. Gupta, R. Panda, R. Hyder, M. Asif, and A. Roy-Chowdhury, "Non-Adversarial Video Synthesis with Learned Priors," in *Proc. Computer Vison and Pattern Recognition (CVPR)*, Seattle, Washington, June 2020.

H1. H. Chen, M. Asif, A. Sankaranarayanan, and A. Veeraraghavan, "FPA-CS: Focal plane array-based compressive imaging in short-wave infrared," in *Proc. Computer Vison and Pattern Recognition (CVPR)*, Boston, Massachusetts, June 2015.

Papers in Conferences and Workshops

(peer-reviewed conferences, 4–8 pages long papers)

C45. M. Krol, R. Hyder, M> Peechatt, A. Prater-Bennette, M. Asif, and P. Markopoulos, "Continual Learning in Convolutional Neural Networks with Tensor Rank Updates," *13th IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM)*, 2024

C44. N. Yismaw, U. Kamilov, and M. Asif, "Parameter-Efficient Adaptation For Computational Imaging," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, April 2024.

C43. B. Jiang, Z. Li, M. Asif, X. Cao, and Z. Ma, "Token-based Spatiotemporal Representation Of The Events," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, April 2024.

C42. E. Chandler, S. Shoushtari, J. Liu, M. Asif, and U. Kamilov, "Overcoming Distribution Shifts in Plug-and-Play Methods with Test-Time Training," *IEEE 9th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, December 2023. doi: 10.1109/CAMSAP58249.2023.10403502

C41. Y. Garg, A. Prater-Bennette, and M. Asif, "Multi-task and multi-domain learning with tensor networksm" in Signal Processing, Sensor/Information Fusion, and Target Recognition XXXII. Vol. 12547. SPIE, 2023.

C40. R. Hyder and M. Asif, "Compressive Sensing with Tensorized Autoencoder," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, June 2023.

C39. C. Henry, M. Asif, Z. Li, "Privacy Preserving Face Recognition with Lensless Camera," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, June 2023.

C38. Y. Zheng and M. Asif, "Coded Illumination meets Lensless Imaging," invited to *Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, California, November 2022.

C37. C. Henry, B. Kathariya, M. Asif, Z. Li, and G. York, "Aerial Image Classification through Thin Lensless Camera, " *IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR)*, August 2022.

C36. F. Arab and M. Asif, "Solving Fourier Phase Retrieval With a Reference Image as a Sequence of Linear Inverse Problems," in *Proc. IEEE Int. Conf. on Image Processing (ICIP)*, September 2021.

C35. Z. Cai, R. Hyder, and M. Asif, "Data-Driven Illumination Patterns for Coded Diffraction Imaging," in *Proc. IEEE Int. Conf. on Image Processing (ICIP)*, September 2021.

C34. M. Sharma, Manish, P. Markopoulos, E. Saber, M. Asif, and A. Prater-Bennette, "Convolutional auto-encoder with tensor-train factorization," in *Proc. of the IEEE/CVF International Conference on Computer Vision Workshops (ICCVW)*, October 2021.

C33. M. Asif and C. Hegde, "The benefits of side information for structured phase retrieval," in *Proc. European Conference on Signal Processing and Communication (EUSIPCO)*, January 2021.

C32. M. Asif and A. Prater-Bennette, "Low-rank tensor ring model for completing missing visual data," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Barcelona, Spain, May 2020.

C31. F. Arab and M. Asif, "Fourier phase retrieval with arbitrary reference signal," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Barcelona, Spain, May 2020.

C30. Y. Zheng, R. Zhang, and M. Asif, "Coded illumination and multiplexing for lensless imaging," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Barcelona, Spain, May 2020.

C29. R. Hyder and M. Asif, "Generative models for low-dimensional video representation and compressive sensing," *Deep Inverse Workshop, Neural Information Processing Systems (NeurIPS)*, Vancouver, Canada, December 2019.

C28. A. Akrami, M. Asif and H. Mohsenian-Rad, "Sparse Distribution System State Estimation: An Approximate Solution Against Low Observability," *IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT)*, Washington, DC 2020, DOI: 10.1109/ISGT45199.2020.9087670.

C27. Y. Zheng and M. Asif, "Image and depth estimation with mask-based lensless cameras," *Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Guadeloupe, West Indies, December 2019.

C26. Y. Zheng and M. Asif, "3D imaging from distributed mask-based line cameras," *Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, California, November 2019.

C25. R. Hyder, C. Hegde, and M. Asif, "Fourier phase retrieval with side information using generative prior," *Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, California, November 2019.

C24. R. Hyder and M. Asif, "Generative models for low-rank video Representation and Reconstruction from compressive measurements," in *Proc. IEEE Int. Workshop on Machine Learning for Signal Processing (MLSP)*, Pittsburgh, Pennsylvania, October 2019.

C23. M. Asif and A. Prater-Bennette, "Multilinear compressive sensing with tensor ring factorization," in *Proc. IEEE Int. Conf. on Image Processing (ICIP)*, Taipei, Taiwan, September 2019.

C22. R. Hyder, V. Shah, C. Hegde, and M. Asif, "Alternating phase projected gradient descent with generative priors for solving compressive phase retrieval," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Brighton, UK, May 2019.

C21. S. Oymak and M. Asif, "Exactly decoding a vector through ReLu activation," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Brighton, UK, May 2019.

C20. M. Asif and C. Hegde, "Phase retrieval for signals in union of subspaces," in *Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Anaheim, California, November 2018.

C19. M. Asif, "Lensless 3D imaging using mask-based cameras," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Calgary, Canada, April 2018.

C18. M. Asif, "Low-rank matrix recovery of dynamic events," *GlobalSIP*, Montreal, Canada, November 2017.

C17. M. Asif, "Toward depth estimation using mask-based lensless cameras," *Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, California, November 2017.

C16. M. Asif, Ali Ayremlou, Aswin Sankaranarayanan, Ashok Veeraraghavan, and Richard Baraniuk, "FlatCam: Replacing lenses with masks and computation," *Extreme Imaging Workshop, International Conference on Computer Vision (ICCV)*, Santiago, Chile, December 2015.

C15. M. Asif, J Romberg, and R Baraniuk, "Calibration-free accelerated dynamic MRI based on low-rank matrix recovery," *Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop*, Cambridge, UK, July 2015.

C14. M. Asif, F. Fernandes, and J. Romberg, "Low-complexity video compression and compressive sensing," *Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, California, November 2013.

C13. M. Asif, A. Charles, J. Romberg, and C. Rozell, "Estimating and dynamic updating of time-varying signals with sparse variations," in *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Prague, Czech Republic, May 2011.

C12. A. Charles, M. Asif, J. Romberg, and C. Rozell, "Sparse penalties in dynamical system estimation,", *Conference on Inf. Sciences and Systems (CISS)*, Baltimore, Maryland, March 2011.

C11. M. Asif and J. Romberg, "Sparse signal recovery and dynamic update of the underdetermined system," *Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, California, November 2010.

C10. P. Boufounos and M. Asif, "Compressive sensing for streaming signals using the streaming greedy pursuit," in *Proc. Military Commun. Conf. (MILCOM)*, San Jose, California, October 2010.

C9. M. Asif, D. Reddy, P. Boufounos, and A. Veeraraghavan, "Streaming compressive sensing for high-speed periodic videos," in *Proc. IEEE Int. Conf. on Image Processing (ICIP)*, Hong Kong, September 2010.

C8. M. Asif and J. Romberg, "On the LASSO and Dantzig selector equivalence," *Conference on inf. sciences and systems (CISS)*, Princeton, New Jersey, March 2010.

C7. P. Boufounos and M. Asif, "Compressive sampling for streaming signals with sparse frequency content," *Conference on Inf. Sciences and Systems (CISS)*, Princeton, New Jersey, March 2010.

C6. M. Asif and Justin Romberg, "Basis pursuit with sequential measurements and time-varying signals," in *Proc. Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Aruba, December 2009.

C5. M. Asif, W. Mantzel, and J. Romberg, "Random channel coding and blind deconvolution," *Allerton Conf. on Communication, Control, and Computing*, Monticello, Illinois, October 2009.

C4. M. Asif, W. Mantzel, and J. Romberg, "Channel protection: Random coding meets sparse channels," *Information Theory Workshop*, Taormina, Italy, October 2009.

C3. M. Asif and J. Romberg, "Dynamic updating for sparse time-varying signals," *Conference on inf. sciences and systems (CISS)*, Baltimore, Maryland, March 2009.

C2. M. Asif and J. Romberg, "Dantzig selector homotopy with dynamic measurements," *IS&T/SPIE Computational Imaging VII*, San Jose, CA, February 2009.

C1. M. Asif and J. Romberg, "Streaming measurements in compressive sensing: ℓ_1 Filtering," *Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, California, October 2008.

PREPRINTS / SUBMITTED

P3. Z. Cai, Y. Tan, M. Asif, "Single Layer Single Gradient Unlearning," *submitted* 2024. [available online arXiv:2407.11867]

P2. Z. Cai, Y. Tan, M. Asif, "Transformation-Dependent Adversarial Attacks," *submitted* 2024. [available online arXiv:2406.08443]

P1. Y. Garg, N. Yismaw, R. Hyder, A. Prater-Bennette, M. Asif. "Factorized Tensor Networks for Multi-Task and Multi-Domain Learning," *submitted* 2024.
[available online arXiv:2310.06124]

Books & Chapters

B1. J. Liu, R. Hyder, M. Asif, and U. Kamilov, "Optimization Algorithms for MR Reconstruction." in *Magnetic Resonance Image Reconstruction Theory, Methods, and Applications*, 2022. Editors M. Akcakaya, M. Doneva, and C. Prieto.

Theses

T2. M. Asif, "Dynamic compressive sensing: Sparse recovery algorithms for streaming signals and videos" *Ph.D. Thesis, Georgia Institute of Technology*, 2013.

T1. M. Asif, "Primal dual pursuit: A homotopy based algorithm for the Dantzig selector, " *M. S. Thesis, Georgia Institute of Technology*, 2008.

Patents

- M. Asif and Y. Zheng , " Joint depth and image reconstruction using coded lensless measurements, " U.S. Patent App. No. 62/812,817. June 2019.
- A. Sankaranarayanan, A. Veeraraghavan, L. Hendricks, R. Baraniuk, A. Ayremlou, and M. Asif, "Lensless imaging system using an image sensor with one or more attenuating layers." U.S. Patent App. No. 15/547,235. January 25, 2018.
- F. Fernandes, E. Faramarzi, M. Asif, and Z. Ma. "Method and system for providing super-resolution of quantized images and video," U.S. Patent App. No. 14/085,486. November 2013.
- F. Fernandes and M. Asif, "Method and apparatus for a video codec with low complexity encoding," U.S. Patent App. No. 13/217,100. August 2011.
- P. Boufounos and M. Asif, "Method for reconstructing sparse streaming signals using greedy search," U.S. Patent No. 8,204,718. June 2012.

Invited Talks

- "Lensless Imaging: Overview, Opportunities, and Challenges," Plenary Speaker at International Congress on Basic Science, July 2024.
- "Parameter-Efficient Methods for Robust Multi-Modal and Multi-Domain Learning," Tsinghua University, July 2024.
- "Parameter-Efficient Methods for Robust Multi-Modal and Multi-Domain Learning," Peking University, July 2024.
- "Factorized Networks for Continual, Multi-task, and Multi-Modal Learning," Washington University St. Louis, Dec 2023.
- "Factorized Tensor Networks for Multi-Task and Multi-Domain Learning," Air Force Institute of Technology (AFIT), August 2023
- "Incremental task learning with incremental rank updates," Invited Talk, Big Data V: Learning, Analytics, and Applications, SPIE Defense and Commercial Sensing, May 2023
- "Blackbox Adversarial Attacks," Guest Lecture in 18-786: Introduction to Deep Learning, Carnegie Mellon University, April 2023
- "Adversarial Attacks for Blackbox Models," Statistics Department, Rice University, February 2023.
- "Hybrid Learning to Sense and Solve for Computational Imaging," Biomedical and Astronomical Signal Processing (BASP) Frontier Conference, February 2023.
- "Computational Lensless Imaging, Overview, Opportunities, and Challenges," Keynote Speaker Amazon Cameras and Sensors Summit, November 2022.

- "Coded Illumination Meets Lensless Imaging," Asilomar Special Session on Deep Learning Based Computational Imaging, November 2022.
- "Holistic Adversarial Attacks for Blackbox Models," Temple University, October 2022.
- "Computational Imaging: sensing and making sense of the world under constraints," UCR Homecoming 2021.
- "Lensless Imaging with Programmable Masks and Illuminations," IEEE SPS SPACE Webinar, November 2021. [YouTube video link]
- "A Simple Framework for 3D Lensless Imaging with Programmable Masks," Asilomar Special Session on Model-Based Deep Learning For Inverse Problems In Imaging, November 2021.
- "AI/ML in Vision and Mobility," Invited Speaker and Panelist in OpenSV Forum and Annual Conference, November 2021
- "3D Lensless Imaging with Programmable Masks and Illumination," Computational Imaging Seminar, Purdue University, October 2021.
- "Solving Inverse Problems using Generative Models," Amazon AWS Seminar, June 2021.
- "The Benefits of Side Information for Structured Phase Retrieval," Special Session on Computational Imaging in the era of Learning: Imagers, priors, and algorithms at EUSIPCO, Jan. 2021.
- "Two Inverse Problems: 3D Lensless Imaging and Generative Priors," Washington University St. Louis, Nov. 2020.
- "Generative Models with Low- Rank Tensor Factorization," Special Session on Generative Models in Imaging at Asilomar Conference, November 2020.
- "Low-Rank Tensor Ring Model for Completing Missing Visual Data," SIAM Imaging Science 2020 (IS20), session on Tensor Methods for Image Processing, July 2020.
- "Generative Models for Low-Rank Image/Video Representation," Google Research, June 2020
- "Coded illumination and multiplexing for lensless imaging," Special Session on Unconventional Sensing at ICASSP, May 2020.
- "Image and depth estimation with mask-based lensless cameras," Special Session on Current trends in computational spectral sensing and imaging at CAMSAP, November 2019.
- "Generative Models for Low-rank Video Representation and Reconstruction from Compressive Measurements," Institute of Mathematics and Applications (IMA), October 2019.
- "Generative Models for Low-Rank Image/Video Representation," Air Force Research Lab, Rome, NY, August 2019.
- "Low-Rank Generative Models for Videos," Workshop on Information Theory and Applications (ITA), February 2019.
- "Dynamic Low-Rank Matrix Recovery in Blind Deconvolution and Phase Retrieval," Workshop on Information Theory and Applications (ITA), February 2017.
- ITA 2017
- "FlatCam: Thin, Bare-Sensor Cameras using Coded Aperture and Computation," Invited talk in International Conference on Computational Photography (ICCP), April 2017.
- "Computational Sensing: Relax and Compute What you Cannot See," UC Riverside Data Science Colloquium, April 2017.
- "Computational Lensless Imaging," Park City Math Institute (PCMI) Summer Session, Utah, July 2016.
- "Computational Lensless Imaging," Image Science Gordon Research Conference, Boston, June 2016.
- "Computational Imaging: Enabling New Imaging Capabilities via Computation,"

Arts and Media Engineering & Electrical Computer and Energy Engineering at Arizona State University, April 2016.
Google Research, April 2016.
Computer, Electrical and Mathematical Sciences and Engineering Division in the King Abdullah University of Science and Technology (KAUST), Saudi Arabia, March 2016.
Electrical and Computer Engineering, University of Delware, February 2016.
Electrical and Computer Engineering, University of California Riverside, February 2016.
Electrical and Computer Engineering, University of Rochester, February 2016.
Computational and Applied Mathematics, Rice University, February 2016.
Center for Signal and Image Processing (CSIP), Georgia Tech, January 2016.
Lab 126, Amazon, January 2016.

- "Blind deconvolution in dynamic MRI," Computational Imaging and Visualization Workshop at King Abdullah University of Science and Technoogy (KAUST), Saudi Arabia, March 2016.
- "Random channel coding and blind deconvolution," Allerton Conf. on Communication, Control, and Computing, October 2009.
- "Channel protection: Random coding meets sparse channels," Information Theory Workshop, Italy, October 2009.

Software Packages

- ℓ_1 **Homotopy:** A collection of MATLAB routines for dynamic updating of various ℓ_1 problems using homotopy.
  Available at https://intra.ece.ucr.edu/~sasif/homotopy
- **Dynamic MRI:** MATLAB implementation of motion-adaptive spatio-temporal regularization (MASTeR), which can be used to recover dynamic MR images from highly undersampled k-space data.
  Available at https://www.ece.ucr.edu/~sasif/dynamicMRI
- **VideoCS:** A MATLAB package accompanying low-complexity video compression papers, which includes forward and adjoint operators for orthogonal, biorthogonal, and complex wavelets, and the code for estimating inter-frame motion using the phases of complex wavelet coefficients.
  Available at https://www.ece.ucr.edu/~sasif/

Teaching Experience

UC Riverside
Riverside, California — June 2016 – Present

- CS 171/EE 142: Introduction to Machine Learning and Data Mining, *Spring 2021*, *Fall 2021*, *Fall 2022*, *Fall 2023*, *Fall 2024*
- EE 142: Pattern Recognition and Analysis of Sensor Data, *Fall 2018*, *2019*
- EE 152: Digital Image Processing, *Fall 2016*, *Winter 2018*, *Summer 2018*, *Winter 2021*
- EE 240: Pattern Recognition, *Spring 2017–2024*
- EE 241: Advanced Image Processing, *Winter 2020*, *Winter 2023*
- EE 260: Topics in Signal Processing: Sparsity, Structure, and Inference, *Winter 2019*

Student supervision

Current students at UC Riverside

1. Yaoteng Tan (PhD student, ECE, Fall 2022 – present)
2. Md Kaykobad Reza (PhD student, CSE, Fall 2022 – present)
3. Nebiyou Yismaw (PhD student, ECE, Fall 2022 – present)

4. Yash Garg (PhD student ECE, Fall 2023 – present)
5. Niki Nezakati (PhD student, ECE, Fall 2023 – present)
6. Mehak Saleem (PhD student, ECE, Fall 2024 – present)

Former graduate students (PhD and MS thesis option)

1. Zikui Cai (PhD ECE, Winter 2020 – Spring 2024; UCR → UMD)
2. Yucheng Zheng (PhD ECE, Fall 2017 – Spring 2023; UCR → Nanjing University)
3. Rakib Hyder (PhD ECE, Fall 2017 – Summer 2022; UCR → Oppo Research)
4. Yash Garg (MS ECE, Fall 2021 – Summer 2023; converted to PhD program)
5. Boyu Hou (MS ECE, Fall 2020 – Fall 2022)
6. Xinxin Xie (MS CSE, Fall 2019 – Spring 2022)
7. Fahimeh Arab (ECE, Fall 2018 – Spring 2021)
8. Rongjia Zhang (MS with thesis, ECE, Fall 2018 – Spring 2020)
9. Ruchira Pratihar (MS, ECE, Fall 2016 – Spring 2018)

Former graduate students (MS project option)

1. Aishwarya Waghachoure (MS Project student, Spring 2022 – Winter 2023)
2. Sridevi Subramanya Raju (MS Project student, Fall 2022 – Winter 2023)
3. Chetan Reddy Mudireddy (MS with thesis, ECE, Spring 2020 – Spring 2021)
4. Fred Shieh (MS with project, CEN, Winter 2020 – Fall 2020)
5. Chi-An Wu (MS with project, CEN, Winter 2020 – Fall 2020)

Former undergraduate students and visitors

1. Connor Stewart (BS ECE, BCOE SECURE program, Fall 2022 – Spring 2023)
2. Armin Masoumian (Visiting PhD student from Universitat Rovira i Virgili in Spain, Summer 2022 – Fall 2022)
3. Yaoteng Tan (BS, ECE, Fall 2021 – Sumer 2022; joined as PhD student)
4. Joseph Spracklen (BS student ECE, BCOE SECURE program, Fall 2022)
5. Syeda Zahra (BS student ECE, BCOE SECURE program, Winter 2022 – Summer 2022)
6. Christopher Ferrendelli (Visiting student from Mt. San Antonio College, MTSAC NSF-ATE STEM Research Program, Summer 2022)
7. Tianzi Luo (MS ECE, Fall 2021 – Spring 2022)
8. Celvin Lizama Pena (BS+MS, CSE, Summer 2021 – Winter 2022)
9. Dilan Wijesinghe (BS, CSE, Summer 2021 – Winter 2022)
10. Ken Shao (BS, ECE, Summer 2021)
11. Heeje Lee (BS, ECE, Summer 2021)
12. Emmanuel Hernandez Moran (Visiting student MSRIP, Summer 2018)
13. Yucheng Zheng (BS, ECE, Fall 2016 – Summer 2017; joined as a PhD student)

University Service

Electrical and Computer Engineering (ECE) Department at UC Riverside

- Chair of Faculty Search Committee (2022–2023)
  (three searches: Biomedical/Computational Imaging, ML/AI, and Robotics)
- ECE Colloquium Organizer (2020–present)
- Member ECE Graduate Committee (2018–2020)
- Faculty search committee member (2019)

UC Riverside

- Chair Senate Committee of Faculty Welfare (September 2024 – present)
- Member Executive Council (September 2024 – present)
- Ex-Officio Member Committee on Academic Freedom (September 2024 – present)
- Ex-Officio Member UC-wide Faculty Welfare Committee (September 2024 – present)
- Member Senate Committee of Faculty Welfare (September 2023 – August 2026)
- Member BCOE Building Planning Committee (August 2024 – present)
- Member BCOE IT Steering Committee (May 2022–present)
- Member Advisory Board, Center for Robotics and Intelligent Systems, (2022–present)
- Member Senate Committee on Academic Integrity (2019–2020)

Professional Service

Editorial Service

- Associate Editor, IEEE Transactions on Multimedia (TMM) (2024–present)
- Associate Editor, IEEE Transactions on Computational Imaging (TCI) (2022–present)
- Associate Editor, IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT) (2021–2023)
- Associate Editor, Frontiers in Signal Processing (2021 – 2022)

Conference Organization

- Area Chair, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2024, 2025
- Area Chair, International Conference on Learning Representations (ICLR) 2024, 2025
- Senior Program Committee Member, AAAI Conference on Artificial Intelligence (AAAI) 2024, 2025.
- Area Chair, IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2023, 2024, 2025
- Co-Chair, Computational Cameras and Displays (CCD) Workshop, CVPR 2024
- Special Sessions Co-Chair and Member Organizing committee, IEEE International Workshop on MultiMedia Signal Processing (MMSP) 2024.
- Co-Chair, Computational Cameras and Displays (CCD) Workshop, CVPR 2023
- Area Chair, IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP) 2020, 2021, 2022, 2023
- Area Chair, IEEE International Conference on Image Processing (ICIP) 2019, 2020, 2021, 2022, 2023, 2024
- Best Paper Awards Committee, IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP) 2023.
- Senior Program Committee Member, International Joint Conference on Artificial Intelligence (IJCAI) 2023.
- Special Session Organizer, *Recent Advances in Robust Learning for Modern Computational Imaging*, ICASSP 2023.

- Finance Chair, International Conference on Computational Photography (ICCP) 2022
- Special Session Organizer, Asilomar Conf. on Signals, Systems, and Computers 2020, 2022
- Session Chair, ICASSP 2019, 2020
- Session Chair, ICIP 2019, 2020, 2021

Society and Technical Committee Membership
- Senior Member IEEE (2020–present)
- Elected Member of IEEE Technical Committee on Computational Imaging (1^{st} term: 2019 – 2021, 2^{nd} term: 2022 – present)
  Awards and Nominations subcommittee Chair (2024 – present) Awards and Nominations subcommittee member (2020 – 2023)
- Member IEEE Data Science Initiative Committee (2022 – present)
- Member IEEE Signal Processing Society
- Member IEEE Circuits and Systems Society

Proposal Panels, Reviews, and Nominations
- Panelist, National Science Foundation (2018, 2019, 2021, 2024)
- Reviewer, Air Force Office of Scientific Research (2022)
- Reviewer, Army Research Laboratory (2023)
- Reviewer, Research Grants Council Hong Kong (2023, 2024)
- Member, Selection and Nomination Committee (Computational Optics), Frontiers of Science Award, International Congress on Basic Sciences (2024)

Reviewer
- IEEE Transactions on Signal Processing
- IEEE Transactions on Computational Imaging
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Image Processing
- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Transactions on Information Theory
- IEEE Journal on Special Topics in Signal Processing
- IEEE Transactions on Medical Imaging
- IEEE Transactions on Biomedical Engineering
- IEEE Signal Processing Letters
- IEEE Transactions on Aerospace and Electronic Systems
- OSA Optica
- OSA Optics Express
- Applied and Computational Harmonic Analysis
- SIAM Journal on Imaging Sciences
- SIAM Journal on Mathematics of Data Science
- ACM Transactions on Mathematical Software
- Elsevier Journal on Digital Signal Processing
- Springer Machine Vision and Applications.

Technical Program Committee Member and Reviewer
- International Conference on Computational Photography (ICCP) 2015–2023
- Conference on Computer Vision and Pattern Recognition (CVPR) 2017–2022
- Neural Information Processing and Systems (NeurIPS) 2019–2022

- AAAI Conference on Artificial Intelligence 2020–2022
- International Conference on Learning Representations (ICLR) 2021
- AISTATS 2019, 2020
- International Conference on Machine Learning (ICML) 2019
- International Conference on Computer Vision (ICCV) 2017, 2019
- International Symposium on Information Theory (ISIT) 2013, 2015
- European Signal Processing Conference (EUSIPCO) 2013

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