Brandon Yushan Feng

Curriculum Vitae

51 Vassar Street
Cambridge, MA 02139
✉ *branfeng@mit.edu*
brandonyfeng.github.io

Education and Experience

2023– **Massachusetts Institute of Technology**, Cambridge, MA.
Postdoctoral Associate at MIT CSAIL
Advisor: William T. Freeman

2024– **Center for Astrophysics | Harvard & Smithsonian**, Cambridge, MA.
Visiting Scientist at AstroAI

2019–2023 **University of Maryland**, College Park, MD.
Ph.D. in Computer Science
Advisor: Amitabh Varshney

2022–2023 **Google**, San Francisco, CA.
Research Scientist Intern at Google AR

2015–2019 **University of Virginia**, Charlottesville, VA.
B.A. in Computer Science | B.A. + M.S. in Statistics

Publications

Journal Papers

IEEE TCI **Exoplanet Imaging via Differentiable Rendering.**
B. Y. Feng, R. Ferrer-Chávez, A. Levis, J. Wang, K. Bouman, W. T. Freeman.
IEEE Transactions on Computational Imaging, 2024.

IEEE TVCG **HoloCamera: Advanced Volumetric Capture for Cinematic-Quality VR Applications.**
J. Heagerty, S. Li, E. Lee, S. Bhattacharyya, S. Bista, B. Brawn, B. Y. Feng, S. Jabbireddy, J. F. JaJa, H. Kacorri, D. Li, D. T. Yarnell, M. Zwicker, A. Varshney.
IEEE Transactions on Visualization and Computer Graphics (TVCG), 2024.

Optica **FPM-INR: Fourier ptychographic microscopy image stack reconstruction using implicit neural representations.**
H. Zhou*, B. Y. Feng*, H. Guo, S. Lin, M. Liang, C. A. Metzler, C. Yang.
Optica, 2023.

Science Advances **NeuWS: Neural Wavefront Shaping for Guidestar-Free Imaging Through Static and Dynamic Scattering Media.**
B. Y. Feng*, H. Guo*, M. Xie, V. Boominathan, M. K. Sharma, A. Veeraraghavan, C. A. Metzler.
Science Advances, 2023.

IEEE TVCG **Neural Subspaces for Light Fields**.
B. Y. Feng, A. Varshney.
IEEE Transactions on Visualization and Computer Graphics (TVCG), 2022.

IEEE JSAIT **TurbuGAN: An Adversarial Learning Approach to Spatially-Varying Multiframe Blind Deconvolution with Applications to Imaging Through Turbulence.**
B. Y. Feng*, M. Xie*, C. A. Metzler.
IEEE Journal on Selected Areas in Information Theory, 2022.

Conference Papers

NeurIPS 2024 **Temporally Consistent Atmospheric Turbulence Mitigation with Neural Representations.**
H. Cai*, J. Chen*, B. Y. Feng, W. Jiang, M. Xie, K. Zhang, C. Fermuller, Y. Aloimonos, A. Veeraraghavan, C. A. Metzler.
The Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024.

ECCV 2024 **Physics-Based Interaction with 3D Objects via Video Generation.**
T. Zhang, H. Yu, R. Wu, B. Y. Feng, C. Zheng, N. Snavely, J. Wu, W. T. Freeman.
European Conference on Computer Vision (ECCV), 2024.

ECCV 2024 **Flash-Splat: 3D Reflection Removal with Flash Cues and Gaussian Splats.**
M. Xie, H. Cai, S. Shah, Y. Xu, B. Y. Feng, J. Huang, C. A. Metzler.
European Conference on Computer Vision (ECCV), 2024.

MICCAI 2024 **EndoSparse: Real-Time Sparse View Synthesis of Endoscopic Scenes using Gaussian Splatting.**
C. Li, B. Y. Feng, Y. Liu, H. Liu, C. Wang, W. Yu, Y. Yuan.
Medical Image Computing and Computer Assisted Intervention (MICCAI), 2024.

MICCAI 2024 **Endora: Video Generation Models as Endoscopy Simulators.**
C. Li*, H. Liu*, Y. Liu*, B. Y. Feng, W. Li, X. Liu, Z. Chen, J. Shao, Y. Yuan.
Medical Image Computing and Computer Assisted Intervention (MICCAI), 2024.

CVPR 2024 **Seeing the World Through Your Eyes.**
H. Alzayer*, K. Zhang* B. Y. Feng, C. A. Metzler, J. Huang.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.

CVPR 2024 **WaveMo: Learning Wavefront Modulations to See Through Scattering.**
M. Xie*, H. Guo* B. Y. Feng, L. Jin, A. Veeraraghavan, C. A. Metzler.
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.

ICCV 2023 **Visualizing Subtle Motions from Time-Varying Radiance Fields.**
B. Y. Feng*, H. Alzayer*, M. Rubinstein, W. T. Freeman, J. Huang.
International Conference on Computer Vision (ICCV), 2023.

ICCV 2023 **StegaNeRF: Embedding Invisible Information within Neural Radiance Fields.**
C. Li*, B. Y. Feng*, Z. Fan*, P. Pan, Z. Wang.
International Conference on Computer Vision (ICCV), 2023.

3DV 2023 **Learning to Estimate 6DoF Pose from Limited Data: A Few-Shot, Generalizable Approach using RGB Images.**
P. Pan*, Z. Fan*, B. Y. Feng*, P. Wang, C. Li, Z. Wang.
International Conference on 3D Vision (3DV), 2023.

BMVC 2023 **Continuous Levels of Detail for Light Field Networks.**
D. Li, B. Y. Feng, A. Varshney.
British Machine Vision Conference (BMVC), 2023.

SIGGRAPH Asia 2022 **VIINTER: View Interpolation With Implicit Neural Representations of Images.**
B. Y. Feng, S. Jabbireddy, A. Varshney.
SIGGRAPH Asia, 2022.

ECCV 2022 **PRIF: Primary Ray-based Implicit Function.**
B. Y. Feng, Y. Zhang, D. Tang, R. Du, A. Varshney.
European Conference on Computer Vision (ECCV), 2022.

ICCV 2021 **SIGNET: Efficient Neural Representation for Light Fields**.
B. Y. Feng, A. Varshney.
International Conference on Computer Vision (ICCV), 2021.

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Protein Science **Benchmarking AlphaFold for Protein Complex Modeling Reveals Accuracy Determinants**.
R. Yin, B. Y. Feng, A. Varshney, R. G. Pierce.
Protein Science, 31 (8).

UIST 2021 **GazeChat: Enhancing Virtual Conferences with Gaze-aware 3D Photos**.
Z. He, K. Wang, B. Y. Feng, R. Du, K. Perlin.
ACM Symposium on User Interface Software and Technology (UIST), 2021.

3DV 2020 **Deep Depth Estimation on 360° Images with a Double Quaternion Loss**.
B. Y. Feng, W. Yao, Z. Liu, A. Varshney.
International Conference on 3D Vision (3DV), 2020.

ISBI 2019 **Prostate Segmentation from 3D MRI Using a Two-stage Model and Variable-input Based Uncertainty Measure**.
H. Pan, B. Y. Feng, C. Meyer, X. Feng.
2019 IEEE 16th International Symposium on Biomedical Imaging (ISBI), 2019.

ISBI 2019 **A Self-adaptive Network for Multiple Sclerosis Lesion Segmentation from Multi-contrast MRI with Various Imaging Sequences**.
B. Y. Feng, H. Pan, C. Meyer, X. Feng.
2019 IEEE 16th International Symposium on Biomedical Imaging (ISBI), 2019.

Media Coverage

2023 **Science.org** *Neural Wavefront Shaping*

2023 **Maryland Today** *UMD Researchers Develop New Imaging Technology That Can 'See' Hidden Objects*

2023 **Photonics.com** *Video Tech Enables Imaging Through Scattering Media*

2023 **ScienceDaily** *NeuWS camera answers 'holy grail problem' in optical imaging*

2023 **Phys.org** *Neural wavefront shaping camera overcomes light scattering problem in optical imaging*

2023 **New Scientist** *Eyeball reflections can reveal a 3D model of what you are looking at*

2023 **Gizmodo** *Computer, Enhance: Scientists Reconstruct Rooms From Eye Reflections*

2023 **TechSpot** *Researchers construct 3D scenes using reflections from eyes*

2023 **Tech Xplore** *Rendering three-dimensional images from eye reflections with NeRF*

2023 **PetaPixel** *Scientists Can Now Reconstruct Rooms from Eye Reflections in Photos*

2023 **Futurism** *Scientists Reconstruct What You're Looking At By Enhancing Reflection In Your Eye*

2023 **New Atlas** *Researchers can now 3D-model a room just from your eye reflections*

2022 **ITmedia News** *Technology to animate profile picture in video conference*

Invited Talks

2025/02 **Machine Learning and Scientific Imaging Conference**
AI as a Lens: Expanding Scientific Vision in Biomedical and Astronomical Imaging.

2025/01 **Annual Meeting of the American Astronomical Society**
AI-Driven Imaging and Inference with Differentiable Computing.

2024/05 **California Institute of Technology** Computational Cameras.
Neural Fields to Solve Inverse Problems in Imaging.

2024/05 **SIAM** Imaging Science.
Ray-based Implicit Function for Neural Surface and Scene Representation.

2023/09 **Massachusetts Institute of Technology** Signals, Information, and Algorithms Laboratory.
Rethinking Machine Learning to Solve Inverse Problems in Imaging with Undetermined Forward Operators.

2022/12 **Massachusetts Institute of Technology** Scene Representation Group.
Designing Neural Fields of Rays and Pixels.

2022/10 **Rice University** Computational Imaging Lab.
Implicit Neural Representations for Graphics and Vision.

2022/09 **University of Maryland** Vision and Learning Lab.
Implicit Neural Representations for Graphics and Vision.

2022/08 **University of Texas at Austin** Visual Informatics Group.
Efficient Implicit Neural Representation for 3D Shapes.

2022/07 **Optica Imaging Congress** COSI.
Adversarial Sensing for Sub-Diffraction Imaging.

2022/06 **Google** AR.
Primary Ray-based Implicit Function.

Awards

2024 **Oral Presentation** (200/8585 = 2.32% Selection Rate),
European Conference on Computer Vision (ECCV) 2024.

2024 **Oral Presentation** (90/11532 = 0.78% Selection Rate),
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2024.

2023 **Best Poster**, International Conference on Computational Photography (ICCP) 2023.

2022 **Runner-Up**, CVPR 2022 UG2+ Challenge.

2021 **Oral Presentation** (210/6236 = 3.36% Selection Rate),
International Conference on Computer Vision (ICCV) 2021.

2019 **Dean's Fellowship**, University of Maryland.

Service

Journal Reviewer	Nature Communications Photonics Research Optics Express Biomedical Optics Express IEEE Transactions on Pattern Analysis and Machine Intelligence IEEE Transactions on Image Processing IEEE Transactions on Computational Imaging IEEE Transactions on Circuits and Systems for Video Technology
Conference Reviewer	CVPR, ICCV, ECCV, ACM SIGGRAPH, ICLR, NeurIPS, ICCP, AAAI
University Service	Organizer, University of Maryland Computer Vision Seminar Organizer, Computational Imaging Workshop at Technica (largest hackathon for underrepresented genders) Reviewer, University of Maryland Computer Science Graduate Program Application