

# Brandon Yushan Feng

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## Education and Experience

- 2023– **Massachusetts Institute of Technology**, Cambridge, MA.  
Postdoctoral Associate in Computer Science and Artificial Intelligence Laboratory (CSAIL)  
Advisor: William T. Freeman
- 2019–2023 **University of Maryland**, College Park, MD.  
Ph.D. in Computer Science  
Committee: Amitabh Varshney (Advisor and Chair), Furong Huang, Christopher A. Metzler, Jia-Bin Huang, Joseph JaJa
- 2022–2023 **Google**, San Francisco, CA.  
Research Scientist Intern (Manager: Yinda Zhang)
- 2015–2019 **University of Virginia**, Charlottesville, VA.  
B.A. in Computer Science and B.A. in Statistics  
M.S. in Statistics

## Research Interests

My research focuses on the interplay between computational imaging, computer vision, and machine learning. I develop physics-informed visual information processing algorithms to reveal, identify, and understand complex phenomena. I am dedicated to pushing the frontiers of visible reality for human and machine vision. My north star is uncovering unseen knowledge crucial for scientific discovery and medical innovation.

## Publications

\* denotes equal contribution

- 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.
- 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.
- IEEE TVCG **Neural Subspaces for Light Fields.**  
B. Y. Feng, A. Varshney.  
IEEE Transactions on Visualization and Computer Graphics, 2022.
- IEEE JSAIT **TurboGAN: 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.
- ICCV 2021 **SIGNET: Efficient Neural Representation for Light Fields.**  
B. Y. Feng, A. Varshney.  
International Conference on Computer Vision (ICCV) 2021.
- 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.

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## Invited Talks

- 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.

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## Media Coverage

- 2023 **Maryland Today** *UMD Researchers Develop New Imaging Technology That Can 'See' Hidden Objects*
- 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*
- 2022 **ITmedia News** *Technology to animate profile picture in video conference*

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## Awards

- 2023 **Best Poster**, International Conference on Computational Photography (ICCP) 2023.
- 2022 **Runner-Up**, CVPR 2022 UG2+ Challenge.
- 2021 **Top 3% Paper**, International Conference on Computer Vision (ICCV) 2021.
- 2019 **Dean's Fellowship**, University of Maryland.

## Service

- Journal Nature Communication
- Reviewer IEEE Transactions on Pattern Analysis and Machine Intelligence  
IEEE Transactions on Image Processing  
IEEE Transactions on Circuits and Systems for Video Technology
- Conference IEEE Conference on Computer Vision and Pattern Recognition (CVPR): 2022 - 2024
- Reviewer International Conference on Computer Vision (ICCV) 2023  
International Conference on Learning Representations (ICLR): 2024  
Neural Information Processing Systems (NeurIPS): 2022-23  
International Conference on Machine Learning (ICML): 2022-23
- University Organizer, University of Maryland Computer Vision Seminar - 2022
- Service Organizer, Computational Imaging Workshop at Technica (largest hackathon for underrepresented genders) - 2022  
Reviewer, University of Maryland Computer Science Graduate Program Application - 2020, 2021, 2022