Viraj Shah

Research Scientist at Google, Mountain View, CA

Email: virajshah@google.com
Website: virajshah.com
Google Scholar Profile

Research Interests

Image Generative Models (GANs and Diffusion Models), Computer Vision, Imaging Inverse Problems

Education

2020–2024 **Ph.D. in Electrical Engineering**, University of Illinois at Urbana-Champaign (UIUC)
Advisor: Dr. Svetlana Lazebnik. CGPA: 4.00/4.00.

2016–2019 **M.S. in Electrical Engineering**, Iowa State University
Advisor: Dr. Chinmay Hegde. CGPA: 3.89/4.00.

2012–2016 **B.Tech. in Electrical Engineering**, Indian Institute of Technology (IIT), Roorkee
CGPA: 8.97/10.00.

Professional Appointments

2024–on **Google**, Mountain View, CA – Research Scientist with Dr. Peyman Milanfar
Research and Development of large-scale generative models for image restoration and editing
Notable Projects: *Photo Unblur in Pixel Camera and Photos App; 2K upscaler in Nano-Banana Pro*

2025–on **IIT Gandhinagar**, India – Guest Faculty

2023–2024 **Google Research**, Cambridge, MA – Research Intern with Nataniel Ruiz and Varun Jampani

2022–2023 **Adobe Research**, San Jose, CA – Research Intern with Julian Philip

2021 **Amazon**, Seattle, WA – Research Intern with Aleix Martinez

2019 **Siemens Healthineers**, Princeton, NJ – Research Intern with Mariappan Nadar

Awards and Honors

2026 **Tech Impact Award**, Google (Platforms and Devices), for Contributions to Image Editing and Enhancement stack

2025 **Outstanding Reviewer**, ICCV 2025

2024 **Best Paper Award**, CVFAD Workshop at CVPR 2024

2023 **DAAD AInet Fellowship**, April cohort in Generative Models [News]

2023 **Joan and Lalit Bahl Fellowship**, ECE UIUC [News]

2023 **Mavis Future Faculty Fellowship**, College of Engineering, UIUC [declined]

2023 **Conference Travel Award**, ECE UIUC

2020 **James M. Henderson Fellowship**, ECE UIUC [News]

2019 **2nd Prize, MRS Open Data Challenge**, Materials Research Society [News]

2016 **Departmental Fellowship**, ECE Iowa State University

Publications

Google Scholar Citations: 4745 / h-index: 13

Key papers are highlighted; * denotes equal contribution; † denotes primary research advising role

Product Reports.

27. **Gemini 2.5: Pushing the Frontier with Advanced Reasoning, Multimodality, and Agentic Capabilities**
Gemini Team, Google
Contributions: Advancing prompt-based image restoration capabilities and building 2K image upscaler

In Submission.

26. **OptIMerge: Optimization-Based Merging of Diffusion Models**
Viraj Shah, Ashwini Pokle, Peyman Milanfar, Mauricio Delbracio, Hossein Talebi

25. **ReGain: Restoring Subject Fidelity in Personalization on Synthetic Images**
Shubhang Bhatnagar, Ishan Bhatnagar, **Viraj Shah**, Narendra Ahuja

24. **ReaDiT Guidance: Control for Image and Video Generation using Diffusion Transformer Features**
Jay Mahajan, Chang Liu, Rauf Makharov, **Viraj Shah**†, Alex Schwing, Svetlana Lazebnik

23. **GaussianMVPS: Revisiting Multi-View Photometric Stereo for Inverse Rendering and Relighting**
Parag Sarvoday Sahu, Ashish Tiwari, **Viraj Shah**, Shanmuganathan Raman

In Conferences and Journals.

22. **FMS^2: Unified Flow Matching for Topology-Preserving Segmentation and Synthesis of Thin Structures**
Babak Asadi, Peiyang Wu, Mani Golparvar-Fard, **Viraj Shah**†, Ramez Hajj
ECCV 2026

21. **Reference-Guided Identity Preserving Face Restoration**
Mo Zhou, Keren Ye, **Viraj Shah**, Kangfu Mei, Mauricio Delbracio, Peyman Milanfar, Vishal Patel, Hossein Talebi
TMLR 2026

20. **UnZipLoRA: Separating Content and Style from a Single Image**
Chang Liu, **Viraj Shah**†, Aiyu Cui, Svetlana Lazebnik
ICCV 2025 [Highlight]

19. **Street TryOn: Learning In-the-Wild Virtual Try-On from Unpaired Images**
Aiyu Cui, Jay Mahajan, **Viraj Shah**, Preeti Gomathinayagam, Chang Liu, Svetlana Lazebnik
WACV 2025
Best Paper Award at CVFAD Workshop, CVPR 2024!

18. **ZipLoRA: Any Subject in Any Style by Effectively Merging LoRAs**
Viraj Shah, Nataniel Ruiz, Forrester Cole, Erika Lu, Svetlana Lazebnik, Yuanzhen Li, Varun Jampani
ECCV 2024

17. **JoIN: Joint GANs Inversion for Intrinsic Image Decomposition**
Viraj Shah, Svetlana Lazebnik, Julien Philip
TMLR 2024

16. **Hybrid CNN-Transformer Model for Predicting Failure Properties of Asphalt Binder**
Babak Asadi, **Viraj Shah**†, Abhilash Vyas, Mani Golparvar, Ramez Hajj
Journal of Computer-Aided Civil and Infrastructure Engineering 2024

15. **InvNet: Encoding Geometric and Statistical Invariances in Deep Generative Models**
Ameya Joshi, Minsu Cho, **Viraj Shah**, Balaji Pokuri, Soumik Sarkar, Baskar Ganapathysubramanian, Chinmay Hegde
AAAI 2020

14. **Sparse Signal Recovery from Modulo Observations**
Viraj Shah, Chinmay Hegde
EURASIP Journal on Advances in Signal Processing 2020

13. **Signal Reconstruction from Modulo Observations**
Viraj Shah, Chinmay Hegde
GlobalSIP 2019

12. **Alternating Phase Projected Gradient Descent with Generative Priors for Compressible Phase Retrieval**
Rakib Hyder, **Viraj Shah**, Chinmay Hegde, Salman Asif
ICASSP 2019

11. **Solving Linear Inverse Problems using GAN Priors: An Algorithm with Provable Guarantees**
Viraj Shah, Chinmay Hegde
ICASSP 2018

10. **Reconstruction from Periodic Nonlinearities, with Applications to HDR Imaging**
Viraj Shah, Mohmmedreza Soltani, and Chinmay Hegde
Asilomar Conference 2017

In Peer-reviewed Workshops.

9. **Hardware-Conditioned Generative Channel Modeling: Diffusion-Based Wireless Dataset Synthesis**
Nitish Deshpande, Sanjay Ganapathy, **Viraj Shah**†
Agents4Science Conference, 2025

8. **Generative AI: Challenges and Opportunities in the Context of India**
Viraj Shah†, Kartik Patel
CVPR 2023 Workshop on Ethical Considerations in Creative Applications of Computer Vision

7. **Generative Models for Solving Nonlinear Partial Differential Equations**
Ameya Joshi*, **Viraj Shah***, Balaji Pokuri, Soumik Sarkar, Baskar Ganapathysubramanian, Chinmay Hegde
NeurIPS 2019 Workshop on Machine Learning for Physical Sciences

6. **Physics-aware Deep Generative Models for Creating Synthetic Microstructures**
Rahul Singh*, **Viraj Shah***, Balaji Pokuri, Soumik Sarkar, Baskar Ganapathysubramanian, Chinmay Hegde
NeurIPS 2018 Workshop on Machine Learning for Molecules and Materials
Second prize at MRS Open Data Challenge 2019!

Preprints.

5. **MultiStyleGAN: Multiple One-shot Image Stylizations using a Single GAN**
Viraj Shah, Ayush Sarkar, Sudharsan Krishna, Svetlana Lazebnik
arXiv:2210.04120, 2022

4. **Make It So: Steering StyleGAN for Any Image Inversion and Editing**
Anand Bhattad, **Viraj Shah**, Svetlana Lazebnik, David Forsyth
arXiv:2304.14403, 2022

3. **Near-perfect GAN Inversion**
Qianli Feng*, **Viraj Shah***, Raghudeep Gadde, Pietro Perona, Aleix Martinez
arXiv:2202.11833, 2022

2. **Provably Convergent Algorithms for Solving Inverse Problems Using Generative Models**
Viraj Shah, Rakib Hyder, Salman Asif, Chinmay Hegde
arXiv:2105.06371, 2021

1. **Encoding Invariances in Deep Generative Models**
Viraj Shah*, Ameya Joshi*, Sambuddha Ghosal, Balaji Pokuri, Soumik Sarkar, Baskar Ganapathysubramanian, Chinmay Hegde
arXiv:1906.01626, 2019

Research Mentorship

Doctoral Students

2025 Mo Zhou, JHU, Research Intern at Google, **Paper accepted to TMLR.**

2025 Babak Asadi, UIUC, **Paper accepted to ECCV, 2026**; 1^{st} **prize in PCI prediction challenge** at Intl. Data Science for Pavements Symposium 2024.

2025 Chang Liu, UIUC, **Paper accepted to ICCV, 2025**.

2025 Nitish Deshpande, UCSD, **Paper accepted to Agents4Science 2025.**

Thesis Advising

2024 Shrey Sarswat, UIUC, **M.S. Thesis** on compositional image generation.

2024 Nidhish Kamath, UIUC, **M.S. Thesis** on statistics-aware GANs.

2024 Eric Ji, UIUC, **B.S. Thesis** on detecting AI generated images. Now : Ph.D. student at UIUC

Invited Talks

2026 IIT Bombay, Research Seminar

2026 IIT Madras, Research Seminar

2025 Sabarmati Research Outreach Conference by IIT Gandhinagar, Chicago

2025 National Youth Convention USA, Panelist, Panel Discussion on Ethics and AI

2024 Google Research, Computer Vision Research Seminar

2023 IIT Gandhinagar, Research Seminar

2023 University of Tubingen, Autonomous Vision Group (Dr. Andreas Geiger Lab), Research Seminar

2022 Adobe Inc., GenAI Research Seminar

2019 MRS Open Data Challenge, Winners' Seminar

Teaching, Leadership, and Service

Teaching

2026 IIT Gandhinagar, SC 395: Short-course on Image Generative Models in Computer Vision [website]

2022 UIUC, ECE 101 Lab: Intro to Technology for Non-engineers [website]

Teaching Assistant,

2023 UIUC, ECE 549: Computer Vision

2022 UIUC, ECE 448: Artificial Intelligence

2018 ISU, CprE 310: Mathematical Foundations of Computer Engineering

Area Chair,

2026 WACV, CVPR

Reviewer,

2026 WACV, CVPR, ECCV, SIGGRAPH Asia, NeurIPS

2025 WACV, CVPR, ICCV, SIGGRAPH, SIGGRAPH Asia, IJCV, Scientific Reports

2024 WACV, CVPR, ECCV, ACCV, ACM Trans. on Graphics (ToG)

2023 IEEE Trans. on Signal Processing (TSP), EURASIP Signal Processing

References

Dr. Svetlana Lazebnik,
Professor, Siebel School of Computing and Data Science, University of Illinois at Urbana-Champaign (UIUC)

Dr. Chinmay Hegde,
Associate Professor, Computer Science and ECE Departments, New York University (NYU)
Previously: Assistant Professor, ECE Department, Iowa State University

Dr. Peyman Milanfar,
Distinguished Scientist, Google,
Previously: Professor and Associate Dean of Research, University of California, Santa Cruz

Dr. Varun Jampani,
Chief AI Officer, Arcade AI
Previously: Senior Research Scientist, Google Research