Anand Bhattad

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Research Interests

Generative Models; Neural Rendering; Inverse Graphics; Intrinsic Images; Image-based Lighting; Perceptual Organization and Physics Awareness in Large Vision Models

Education

University of Illinois Urbana-Champaign (UIUC), USA

Ph.D., Computer Science 2019 – 2024
Thesis: **Exploring Knowledge in Generative Models**
Thesis committee: **David Forsyth (Advisor)**, Alexei A. Efros, William T. Freeman, Derek Hoiem, Svetlana Lazebnik, Shenlong Wang

M.S., Computer Science 2017 – 2018
M.S., Civil Engineering 2015 – 2017

National Institute of Technology Karnataka (NITK) Surathkal, India

B.Tech., Civil Engineering 2011 – 2015

Work Experience

Toyota Technological Institute at Chicago, Research Assistant Professor 2023 – now

University of California Berkeley, Visiting Scholar; Host: Alexei A. Efros 2024

Allen Institute of Artificial Intelligence, Research Intern with Aniruddha Kembhavi 2023

Intel, Research Intern with Stephan R. Richter in Vladlen Koltun's team 2021

NVIDIA, Research Intern with Andrew Tao and Bryan Catanzaro 2020

Fyusion Inc, Research Intern with Abhishek Kar and Rodrigo Ortiz Cayon 2019

Siemens Corporate Technology, Computer Vision & DL Intern with Jan Ernst 2017

Michigan State University, Research Intern with Nizar Lajnef 2014

IIIT Hyderabad, Research Intern with Ramacharla Pradeep Kumar 2013

Selected Honors and Awards

Outstanding Reviewer, ICCV 2023

Best Paper Nomination, CVPR 2022

Outstanding Emergency Reviewer, CVPR 2021

Excellent Teaching Assistant, Intro Computing: Engrg & Sci 2016

Papers Under Review

Self-selected Key Papers are Highlighted; * denotes equal contribution, and † indicates equal advising

2. **Visual Jenga: Discovering Object Dependencies via Counterfactual Inpainting**
   Anand Bhattad, Konpat Preechakul, Alexei A. Efros
   In Submission

1. **SpotLight: Shadow-Guided Object Relighting via Diffusion**
   Frédéric Fortier-Chouinard, Zitian Zhang, Louis-Etienne Messier, Mathieu Garon, **Anand Bhattad**, Jean-François Lalonde

In Submission

Refereed Conference Papers

17. **LumiNet: Latent Intrinsics Meets Diffusion Models for Indoor Scene Relighting**
Xiaoyan Xing, Konrad Groh, Sezer Karaoglu, Theo Gevers, **Anand Bhattad**
CVPR 2025

16. **ScribbleLight: Single Image Indoor Relighting with Scribbles**
Jun Myeong Choi, Annie N. Wang, Pieter Peers, **Anand Bhattad**, Roni Sengupta
CVPR 2025

15. **UrbanIR: Large-Scale Urban Scene Inverse Rendering from a Single Video**
Zhi-Hao Lin, Bohan Liu, Yi-Ting Chen, Kuan-Sheng Chen, David A. Forsyth, Jia-Bin Huang, **Anand Bhattad**, Shenlong Wang
3DV 2025

14. **ZeroComp: Zero-shot Object Compositing from Image Intrinsics via Diffusion**
Zitian Zhang, Frédéric Fortier-Chouinard, Mathieu Garon, **Anand Bhattad**, Jean-François Lalonde
WACV 2025 (Oral presentation)

13. **Latent Intrinsics Emerge from Training to Relight**
Xiao Zhang, William Gao, Seemandhar Jain, Michael Maire, David A. Forsyth, **Anand Bhattad**
NeurIPS 2024 (Spotlight presentation)

12. **From an Image to a Scene: Learning to Imagine the World from a Million 360° Videos**
Matthew Wallingford, **Anand Bhattad**, Aditya Kusupati, Vivek Ramanujan, Matt Deitke, Sham Kakade, Aniruddha Kembhavi, Roozbeh Mottaghi, Wei-Chiu Ma, Ali Farhadi
NeurIPS 2024

11. **Videoshop: Localized Semantic Video Editing with Noise-Extrapolated Diffusion Inversion**
Xiang Fan, **Anand Bhattad**†, Ranjay Krishna†
ECCV 2024

10. ***Shadows Don't Lie and Lines Can't Bend!* Generative Models Don't Know Projective Geometry...For Now**
Ayush Sarkar⋆, Hanlin Mai⋆, Amitabh Mahapatra⋆, Svetlana Lazebnik, David A. Forsyth, **Anand Bhattad**
CVPR 2024

9. **StyLitGAN: Image-based Relighting via Latent Control**
Anand Bhattad, James Soole, David A. Forsyth
CVPR 2024

8. **StyleGAN Knows Normals, Depth, Albedo, and More**
Anand Bhattad, Daniel McKee, Derek Hoiem, David A. Forsyth
NeurIPS 2023

7. **OBJect 3DIT: Language-guided 3D-aware Image Editing**
Oscar Michel, **Anand Bhattad**, Eli Vanderbilt, Ranjay Krishna, Aniruddha Kembhavi, Tanmay Gupta
NeurIPS 2023

6. **Improving Equivariance in State-of-the-Art Supervised Depth and Normal Predictors**
Yuanyi Zhong, **Anand Bhattad**, Yuxiong Wang, David A. Forsyth
ICCV 2023

5. **Cut-and-Paste Object Insertion by Enabling Deep Image Prior for Reshading**
Anand Bhattad, David A. Forsyth
3DV 2022 (Spotlight presentation)

4. **DIVeR: Real-time and Accurate Neural Radiance Fields with Deterministic Integration for Volume Rendering**

Liwen Wu, Jae Yong Lee, **Anand Bhattad**, Yuxiong Wang, David A. Forsyth
CVPR 2022 (Best Paper Nomination; Oral presentation)

3. **View Generalization for Single Image Textured 3D Models**
Anand Bhattad, Aysegul Dundar, Guilin Liu, Andrew Tao, Bryan Catanzaro
CVPR 2021

2. **Unrestricted Adversarial Perturbations via Semantic Manipulation**
Anand Bhattad⋆, Min-Jin Chong⋆, Kaizhao Liang, Bo Li, David A. Forsyth
ICLR 2020

1. **Improved Style Transfer with Calibrated Metrics**
Mao-Chuang Yeh⋆, Shuai Tang⋆, **Anand Bhattad**, Chuhang Zou, David A. Forsyth
WACV 2020

Refereed Workshop Papers

5. **Intrinsic LoRA: A Generalist Approach for Discovering Knowledge in Generative Models**
Xiaodan Du, Nicholas Kolkin, Greg Shakhnarovich, **Anand Bhattad**
CVPR-W 2024 (Oral presentation)
workshops: Generative Models for CV, AI for 3D Gen, SyntaGen, SynthData4CV, Dataset Distillation

4. **UrbanIR: Large-Scale Urban Scene Inverse Rendering from a Single Video**
Zhi-Hao Lin, Bohan Liu, Yi-Ting. Chen, David A. Forsyth, Jia-Bin Huang, **Anand Bhattad**, Shenlong. Wang
CVPR-W 2024
workshop: SynthData4CV

3. **MIMIC: Masked Image Modeling with Image Correspondences**
Kalyani Marathe, Mahtab Bigverdi, Nishat Khan, Tuhin Kundu, Patrick Howe, Sharan Ranjit S, **Anand Bhattad**, Aniruddha Kembhavi, Linda G. Shapiro, Ranjay Krishna
CVPR-W 2024
workshop: 3D with Multi-View Supervision (Archival long paper)

2. **Big but Imperceptible Adversarial Perturbations via Semantic Manipulation**
Anand Bhattad⋆, Min-Jin Chong⋆, Kaizhao Liang, Bo Li, David A. Forsyth
CVPR-W 2019 (Oral presentation)
workshop: Adversarial Machine Learning in Real-World Computer Vision Systems

1. **Detecting Anomalous Faces with "No Peeking" Autoencoders**
Anand Bhattad, Jason Rock, David A. Forsyth
CVPR-W 2018 (Oral presentation)
workshop: Vision with Biased and Scarce Data

Technical Reports

4. **Generative Models: What Do They Know? Do They Know Things? Let's Find Out!**
Xiaodan Du, Nicholas Kolkin, Greg Shakhnarovich, **Anand Bhattad**
Technical Report, arXiv 2024

3. **Blocks2World: Controlling Realistic Scenes with Editable Primitives**
Vaibhav Vavilala, Seemandhar Jain, Rahul Vasanth, **Anand Bhattad**, David A. Forsyth
Technical Report, arXiv 2023

2. **Make It So: Steering StyleGAN for Any Image Inversion and Editing**
Anand Bhattad, Viraj Shah, Derek Hoiem, David A. Forsyth
Technical Report, arXiv 2023

1. **SIRfyN: Single Image Relighting from your Neighbors**
David A. Forsyth, **Anand Bhattad**, Pranav Asthana, Yuanyi Zhong, Yuxiong Wang
Technical Report, arXiv 2021

Patents

1. **Intrinsic-ControlNet: Zero-shot Object Compositing from Image Intrinsics**
   Zitian Zhang, Frédéric Fortier-Chouinard, Mathieu Garon, **Anand Bhattad**, Jean-François Lalonde
   Pending

Mentoring

Doctoral Students

- Jun Myeong Choi , UNC Chapel Hill, **Paper in CVPR 2025** 2024 – now
- William Gao, UChicago, **Paper in NeurIPS 2024** 2024 – now
- Xiaoyan Xing, University of Amsterdam, **Paper in CVPR 2025** 2024 – now
- Vaibhav Vavilala, UIUC, Paper under Review 2023 – now
- Xiao Zhang, UChicago, **Paper in NeurIPS 2024** 2023 – now
- Zitian Zhang, Université Laval, **Paper in WACV 2025** & Paper under Review 2023 – now
- Xiang Fan, University of Washington, **Paper in ECCV 2024** 2023 – 2024
- Matthew Wallingford, University of Washington, **Paper in NeurIPS 2024** 2023 – 2024
- Xiaodan Du, TTIC, **Paper in CVPR-W 2024** 2023 – 2024
- Ayush Sarkar, UIUC, **Paper in CVPR 2024** 2023 – 2024
- Zhi-Hao Lin, UIUC, **Paper in CVPR-W 2024 & Paper in 3DV 2025** 2023 – 2024
- Kalyani Marathe, University of Washington, **Paper in CVPR-W 2024** 2023 – 2024

Master's Students

- Yixin (Tracy) Zhu, UChicago, Project on Improving Projective Geometry 2024 – now
- Hanlin (Asher) Mai, UIUC, **Paper in CVPR 2024** 2023 – now
- Frédéric Fortier-Chouinard, Université Laval, **Paper in WACV 2025** & Paper under Review 2023 – now
- Seemandhar Jain, UIUC | Now: PhD at UCSD, **Paper in NeurIPS 2024** 2023 – 2024
- James Soole, UIUC | Now: Research Engineer at MATLAB, **Paper in CVPR 2024** 2023
- Feiran Wang, UIUC, Project on NeRF + Latent Illumination 2023
- Pranav Asthana, UIUC | Now: PhD at UMD, Project on Relighting from Neighbors 2021 – 2022
- Kexuan (Klaus) Zou, UIUC | Now: Software Engineer at NVIDIA, Project on 2D Meshes 2019 – 2020

Bachelor's Students

- Zhiyan (Alex) Wang, UChicago, Project on Improving Projective Geometry 2024 – now
- Joshua Ahn, UChicago, Project on Wavelets in Neural Radiance Fields 2024
- Amitabh Mahapatra, UIUC, **Paper in CVPR 2024** 2023 – now
- Kuan-Sheng Chen, UIUC, Project on Improving Generative Models with Intrinsic Images 2023
- Oscar Michel, AI2 | Now: PhD at NYU, **Paper in NeurIPS 2023** 2023
- Liwen Wu, UIUC | Now: PhD at UCSD, **Paper in CVPR 2022 (Best Paper Nomination)** 2022
- Brian Chen, UIUC | REU at CMU's RI | Next: Hive AI, Project on Lighting Correction 2020 – 2022
- Anchu Zhu, UIUC | Next: MS in CS at USC, Project on Anomaly Detection 2018 – 2019

Doctoral Committees

- William Gao, "Neural Methods for 3D Mesh Editing", UChicago 2025
- Xiao Zhang, "Representation Learning from and for Generative Models", UChicago 2025
- Xin Yuan, "Interpretable Unsupervised Generative Learning via Factorized Architectures and Structured Bottlenecks", UChicago 2024

Courses Designed

Past Meets Present: A Tale of Two Visions, TTIC; *Course Instructor* Spring 2024

- Developed a new course from scratch on Computer Vision, combining historical and modern approaches
- Taught a class of 20+ students from TTIC and UChicago

Teaching Assistant

Computer Science, UIUC; *Graduate Teaching Assistant* 2016 – 2018

- Applied Machine Learning (CS498 AML), Fall 2018
- Data Structures (CS 225), Spring 2017
- Intro Computing: Engrg & Sci (CS 101), Spring 2016 & Fall 2016

Invited Talks

Emergent Latent Intrinsic Representations for Scene Relighting

- UChicago, Great Lakes Graphics Workshop Apr 2025

What Generative Image Models Understand (and Don't) about the Physical World

- JHU, CS/LCSR Seminar Mar 2025
- UC Irvine, CS Seminar Mar 2025
- Stony Brook University, CS Seminar Mar 2025
- UIUC: External Speaker Series Feb 2025
- UCSD: Pixel Cafe Seminar Jan 2025

Are Generative Image Models Physically Grounded?

- UPenn: GRASP Seminar Dec 2024
- NYU: Guest Lecture in Saining Xie's Computer Vision Course Dec 2024

Generative Models Inside Out

- Midwest Computer Vision Workshop, Indiana University Sep 2024

What Do Generative Image Models Know?

- IIIT Hyderabad, India; Vision Seminar Jan 2024
- Exactech, Inc.; Tech Talk Oct 2023

Exploring Knowledge in Generative Models

- Stanford University in Jiajun Wu's group Jun 2023
- University of Tubingen, Autonomous Vision Group May 2023

What Do Generative Models Know about Geometry and Illumination?

- UC Berkeley: Vision Seminar Apr 2023
- NVIDIA Research Apr 2023
- MIT: Vision and Graphics Seminar Apr 2023
- CMU: VASC Seminar Mar 2023
- UW: RAIVN Vision Seminar Mar 2023

Towards a Productive and Fun PhD Experience

- UIUC: Computer Vision Workshop Apr 2023

Learning about Light Without Labeled Data

- UMD: Vision Seminar Mar 2023
- UCSD: Pixel Cafe Seminar Feb 2023
- TTIC: Research Talk Feb 2023

Drag-and-Drop Rendering: Towards In the Wild Image Editing

- CMU: Misc-Read Vision Reading Group Aug 2021

Services & Leadership

Reviewing

- **Area Chair**, ICCV 2025, CVPR 2025, WACV 2025 2024 – now

- **Reviewer**, CVPR, NeurIPS, ECCV, ICCV and PAMI 2018 – now

Community Building Workshops

- **Lead Organizer**, "How to Stand Out in the Crowd?" workshop at CVPR Jun 2025
- **Lead Organizer**, "CV 20/20: A Retrospective Vision" workshop at CVPR Jun 2024
- **Lead Organizer**, "Scholars & Big Models: How Can Academics Adapt?" workshop at CVPR Jun 2023

Technical Workshops

- **Co-Organizer**, "Ind3D: Enforcing geometric, physical, topological, and functional inductive bias in 3D generation" workshop at CVPR Jun 2025
- **Lead Organizer**, "Knowledge in Generative Models" workshop at ECCV Sep 2024
- **Co-lead Organizer**, "Multimodal Artificial Intelligence " workshop at TTIC Aug 2024
- **Lead Organizer**, Computer Vision workshop at Allerton, UIUC Apr 2023
- **Committee**, "Adversarial ML in Real-World Computer Vision Systems", workshop at CVPR Jun 2019
- **Committee**, "Security and Privacy in Machine Learning" workshop at ICML Jun 2019

Seminars and Reading Groups

- **Organizer**, UIUC Vision Seminar, a new weekly seminars inviting speakers outside UIUC 2021 – 2023
- **Organizer**, Vision Lunch (computer vision reading group) 2021 – 2023
- **Organizer**, UIUC Summer Vision Coffee 2018

Co-Founder, SchoolEngg 2013 – 2015

- Forum for high-school students; providing firsthand knowledge of all engineering disciplines
- Renamed as *PrepLift*, an education counselling start-up in India

Co-Founder, American Society of Civil Engineers (ASCE) NITK Chapter 2013 – 2015

- Co-Founded the *first* ASCE student chapter of India
- Served as treasurer for one year and as a senior advisor for the second year
- Coordinated with board members, faculty, and outside organizations to facilitate 10+ events