

## 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

7. **VISUAL JENGA: Discovering Object Dependencies through Sequential Scene Decomposition**

Anand Bhattad, Konpat Preechakul, Alexei A. Efros

*In Submission*

6. **LUMINET: : Latent Intrinsic Meets Diffusion Models for Indoor Scene Relighting**

Xiaoyan Xing, Konrad Groh, Sezer Karaoglu, Theo Gevers, Anand Bhattad

*In Submission*

5. **SPOTLIGHT: Shadow-Guided Object Relighting via Diffusion**  
Frédéric Fortier-Chouinard, Zitian Zhang, Louis-Etienne Messier, Mathieu Garon, **Anand Bhattad**, Jean-François Lalonde  
*In Submission*
4. **ScribbleLight: Single Image Indoor Relighting with Scribbles**  
Jun Myeong Choi, Annie N. Wang, Pieter Peers, **Anand Bhattad**, Roni Sengupta  
*In Submission*
3. **Blocks2World: Controllable Image Editing with Convex Primitives**  
Vaibhav Vavilala, Seemantihar Jain, Rahul Vasanth, David A. Forsyth, **Anand Bhattad**  
*In Submission*
2. **Improving Projective Geometry in Generated Images**  
Amitabh Mahapatra\*, Tracy Yixin Zhu\*, Zhiyan Wang\*, Svetlana Lazebnik, David A. Forsyth, **Anand Bhattad**  
*In Submission*
1. **Generative Models: What Do They Know? Do They Know Things? Let's Find Out!**  
Xiaodan Du, Nicholas Kolkin, Greg Shakhnarovich, **Anand Bhattad**  
*In Submission*

## Refereed Conference Papers

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 Intrinsic via Diffusion**  
Zitian Zhang, Frédéric Fortier-Chouinard, Mathieu Garon, **Anand Bhattad**, Jean-François Lalonde  
*WACV 2025*
13. **Latent Intrinsic Emerge from Training to Relight**  
Xiao Zhang, William Gao, Seemantihar 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**<sup>†</sup>, Ranjay Krishna<sup>†</sup>  
*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**, Chuhan 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

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 Intrinsic**

Zitian Zhang, Frédéric Fortier-Chouinard, Mathieu Garon, Anand Bhattad, Jean-François Lalonde  
Pending

## Mentoring

### Doctoral Students

- Jun Myeong Choi, UNC Chapel Hill, Paper under Review 2024 – now
- William Gao, UChicago, Paper in NeurIPS 2024 2024 – now
- Xiaoyan Xing, University of Amsterdam, Paper under Review 2024 – now
- Vaibhav Vavilala, UIUC, Paper under Review 2023 – now
- Xiao Zhang, UChicago, Paper in NeurIPS 2024 2023 – now
- Matthew Wallingford, University of Washington, Paper in NeurIPS 2024 2023 – now
- Xiaodan Du, TTIC, Paper in CVPR-W 2024 & Paper under Review 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 – now
- Ayush Sarkar, UIUC, Paper in CVPR 2024 2023 – now
- 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, Paper under Review 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, Paper under Review 2024 – now
- Joshua Ahn, UChicago, Project on Wavelets in Neural Radiance Fields 2024
- Amitabh Mahapatra, UIUC, Paper in CVPR 2024 & Paper under Review 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

- 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

### 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**, 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 (*proposal in review*) 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

- **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