

EDUCATION

University of California, Berkeley 2018 - 2023

Ph.D. in Computer Science

Advisors: Prof. Jitendra Malik and Prof. Angjoo Kanazawa

Indian Institute of Technology, Bombay 2014 - 2018

B.Tech. (with Honors) in Computer Science and Engineering

RESEARCH INTERESTS

3D Computer Vision. I'm interested in using images and videos for building a better 3D understanding of the world. In the past, I've worked on Formal Methods and Program Verification.

EXPERIENCE

Research Scientist Avataar Inc., San Francisco 2023 - Present

SCHOLASTIC ACHIEVEMENTS

- Secured All India Rank 6 in JEE Advanced 2014 among 150 thousand candidates
- Secured All India Rank 50 in JEE Mains 2014 among over 1.3 million candidates
- Received the Institute Academic Award, IIT Bombay for exceptional academic performance in 2014-15

Olympiads & Scholarships

- Silver Medalist at the 46th International Chemistry Olympiad, Hanoi, Vietnam held in 2014
- Recipient of the KVPY (Kishore Vaigyanik Protsahan Yojana Fellowship) in 2013 by Govt. of India
- Awarded the NTSE (National Talent Search Examination) Scholarship in 2010 by N.C.E.R.T. New Delhi

PUBLICATIONS

- [9] **Spatial Cognition from Egocentric Video: Out of Sight, Not Out of Mind**
Chiara Plizzari, Shubham Goel, Toby Perrett, Jacob Chalk, Angjoo Kanazawa, Dima Damen
3DV 2024
- [8] **The More You See in 2D the More You Perceive in 3D**
Xinyang Han, Zelin Gao*, Angjoo Kanazawa, Shubham Goel*, Yossi Gandelsman**
CVPR 2024
- [7] **Humans in 4D: Reconstructing and Tracking Humans with Transformers**
Shubham Goel, Georgios Pavlakos, Jathushan Rajasegaran, Angjoo Kanazawa, Jitendra Malik**
ICCV 2023
- [6] **Differentiable Stereopsis: Meshes from Multiple Views using Differentiable Rendering**
Shubham Goel, Georgia Gkioxari, Jitendra Malik
CVPR 2022
- [5] **ABO: Dataset and Benchmarks for Real-World 3D Object Understanding**
Jasmine Collins, Shubham Goel, Achleshwar Luthra, Leon Xu, Kenan Deng, Xi Zhang, Tomas F. Yago Vicente, Himanshu Arora, Thomas Dideriksen, Matthieu Guillaumin, Jitendra Malik
CVPR 2022
- [4] **Shape and Viewpoint without Keypoints**
Shubham Goel, Angjoo Kanazawa, Jitendra Malik
ECCV 2020
- [3] **Boolean Functional Synthesis: Hardness and Practical Algorithms[†]**
S. Akshay, Supratik Chakraborty, Shubham Goel, Sumith Kulal, Shetal Shah
FMSD 2020

[2] **What's hard about Boolean Functional Synthesis?**[†]

S. Akshay, Supratik Chakraborty, Shubham Goel, Sumith Kulal, Shetal Shah
CAV 2018

[1] **Computing Scores of Forwarding Schemes in Switched Networks with Probabilistic Faults**[†]

Guy Avni, Shubham Goel, Thomas A. Henzinger, Guillermo Rodriguez-Navas
TACAS 2017

** Equal Contribution.

[†] Names of authors sorted alphabetically by last name.

TEACHING & MENTORING

Graduate Student Instructor, UC Berkeley

- CS 184 : Computer Graphics under Prof. Ren Ng and Prof. James F. O'Brien Spring 2023
- CS 280 : Graduate Computer Vision under Prof. Jitendra Malik and Prof. Stella Yu Spring 2020

Teaching Assistant, IIT Bombay

- MA 105 : Advanced Calculus under Prof. I.K.Rana Fall 2015
- CS 226 : Digital Logic Design under Prof. Supratik Chakraborty (awarded TA of the Month) Spring 2017, 2018

Mentoring, IIT Bombay

- Institute Student Mentorship Programme (mentored 12 freshmen) 2017-18
- Department Academic Mentorship Programme (mentored 6 sophomores) 2017-18

OTHER RESEARCH EXPERIENCE

Abstract Interpretation for Graphics Renderers

Spring 2019

Guide: Prof. Sanjit Seshia, UC Berkeley

- Designed an abstract domain for (over- and under-) approximating the graphics rendering pipeline for a tri-mesh.
- It enables pushing properties over the semantic space (in the 3D world) through a graphics renderer to pixel space.
- Could potentially be used for proving robustness of a downstream ML-based vision component to ϵ -ball perturbations in the (semantic) space of vertex positions

Estimating Dense Correspondences on Wide Baseline Images

2017 - 18

Guide: Prof. Arjun Jain, IIT Bombay

- Worked on finding coarse-to-fine dense correspondences between wide-baseline images in a fully supervised setting.
- We used a correlation volume that encoded descriptor similarity between points and coarse regions in the first and second image respectively
- Achieved promising results on relatively planar surfaces but didn't perform very well in the typical case with high occlusions and disocclusions.

Restoration of Manifold-Valued Images

Summer 2017

Guide: Prof. Stefan Roth, TU Darmstadt

- Worked on restoration (denoising and inpainting) of images that take values in Riemannian manifolds
- Explored the use of higher order differences and arbitrary filters in modeling the loss objective.
- Came up with a family of frameworks for applying arbitrary zero-sum filters to manifold valued patches; Provided flexibility and generalized previously defined first and second order differences over manifolds

EXTRACURRICULARS

- Attended the Second Indian SAT+SMT School held at Infosys, Mysore in 2017
- Secured 2nd place in the Computer Vision track for IIT Bombay in the Inter-IIT Tech meet 2018 in Madras, India.
- Ranked 14th in ACM ICPC Chennai onsite contest and 20th in the online regionals in 2016
- Qualified for the onsite finals of Microsoft's Build The Shield, a network security competition