

# Utkarsh Mall

POSTDOCTORAL RESEARCH SCIENTIST, COLUMBIA UNIVERSITY

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## Education and Academic Appointments

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### Columbia University

Postdoctoral Research Scientist in Computer Science  
Advisor: Carl Vondrick

2023-Present

### Cornell University

M.S. and Ph.D. in Computer Science  
Thesis: Visual Discovery from Spatio-Temporal Imagery  
Advisors: Kavita Bala and Bharath Hariharan

2017-2023

### Indian Institute of Technology Bombay

B.Tech with Honors in Computer Science and Engineering  
Thesis: Motion Generation and Cleaning with Recurrent Frameworks  
Advisors: Siddhartha Chaudhuri

2013-2017

## Research Interests

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*My research lies in computer vision. I build computer vision tools to enable automatic scientific discovery from large-scale data. My research builds foundation vision models for expert domains. My research also improves these foundation models to make them more suitable for scientific applications enabling discovery. In interdisciplinary collaboration with domain experts from climate scientists, crop scientists to fashion anthropologists, I also apply these methods to a diverse set of real-world scientific problems.*

## Publications

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### 1. DiSciPLE: Learning Interpretable Programs for Scientific Visual Discovery

Utkarsh Mall, Cheng Perng Phoo, Mia Chiquier, Bharath Hariharan, Kavita Bala, Carl Vondrick  
In Submission to CVPR, 2025

### 2. Scale-aware Recognition in Satellite Images under Resource Constraint

Shreelekha Revankar, Cheng Perng Phoo, Utkarsh Mall, Bharath Hariharan, Kavita Bala  
In Submission to ICLR, 2025

### 3. Remote Sensing Vision-Language Foundation Models without Annotations via Ground Remote Alignment

Utkarsh Mall, Cheng Perng Phoo, Meilin Kelsey Liu, Carl Vondrick, Bharath Hariharan, Kavita Bala  
International Conference on Learning Representations (ICLR), 2024

### 4. AllClear: A Comprehensive Dataset and Benchmark for Cloud Removal in Satellite Imagery

Hangyu Zhou, Chia Hsiang Kao, Cheng Perng Phoo, Utkarsh Mall, Bharath Hariharan, Kavita Bala  
Neural Information Processing Systems (Neurips), Datasets and Benchmarks Track, 2024

### 5. How Video Meetings Change Your Expression

Sumit Sarin, Utkarsh Mall, Purva Tendulkar, Carl Vondrick  
European Conference on Computer Vision (ECCV), 2024

### 6. Evolving Interpretable Visual Classifiers with Large Language Models

Mia Chiquier, Utkarsh Mall, Carl Vondrick  
European Conference on Computer Vision (ECCV), 2024

## **7. Change-Aware Contrastive Learning for Satellite Images**

**Utkarsh Mall**, Bharath Hariharan, Kavita Bala  
Computer Vision and Pattern Recognition (CVPR), 2023

## **8. Change Event Dataset for Discovery from Spatio-temporal Remote Sensing Imagery**

**Utkarsh Mall**, Bharath Hariharan, Kavita Bala  
Neural Information Processing Systems (Neurips), Datasets and Benchmarks Track (**Featured**), 2022

## **9. Zero-shot Learning Using Multimodal Descriptions**

**Utkarsh Mall**, Bharath Hariharan, Kavita Bala  
CVPR Workshop on Learning with Limited Labelled Data for Image and Video Understanding, 2022

## **10. Discovering Underground Maps from Fashion**

**Utkarsh Mall**, Kavita Bala, Tamara Berg, Kristen Grauman  
Winter Conference on Applications of Computer Vision (WACV), 2022

## **11. Field-Guide-Inspired Zero-Shot Learning**

**Utkarsh Mall**, Bharath Hariharan, Kavita Bala  
International Conference on Computer Vision (ICCV), 2021

## **12. PiCIE: Unsupervised Semantic Segmentation using Invariance and Equivariance in Clustering**

Jang Hyun Cho, **Utkarsh Mall**, Kavita Bala, Bharath Hariharan  
Computer Vision and Pattern Recognition (CVPR), 2021

## **13. GeoStyle: Discovering Fashion Trends and Events**

**Utkarsh Mall**, Kevin Matzen, Bharath Hariharan, Noah Snavely, Kavita Bala  
International Conference on Computer Vision (ICCV), 2019

## **14. Batch-Switching Policy Iteration**

Shivaram Kalyanakrishnan, **Utkarsh Mall**, Ritish Goyal  
International Joint Conference on Artificial Intelligence (IJCAI), 2016

## ***Inter-disciplinary Publications and Technical Reports***

## **15. How physical neighborhood features drive differences in health impacts of tropical cyclones**

**Utkarsh Mall**, Carl Vondrick, Marianthi Anna Kioumourtzoglou, Robbie M Parks  
ISEE Conference Abstracts, 2024

## **16. Computing colorism: skin tone in online retail imagery**

Chelsea Butkowski, Lee Humphreys, **Utkarsh Mall**  
Visual Communication, 2022

## **17. ML for Tracking Fashion Trends: Documenting the Frequency of the Baseball Cap on Social Media and the Runway**

Rachel Rose Getman, Denise Nicole Green, Kavita Bala, **Utkarsh Mall**, Nehal Rawat, Sonia Appasamy, Bharath Hariharan  
Clothing and Textiles Research Journal, June 2020

## **18. Studying the Effect of Spatial Distribution of Dynein Motors**

Hanumant Pratap Singh, Anjneya Takshak, **Utkarsh Mall**, Ambarish Kunwar  
International Journal of Modern Physics C (IJMPC) 2016

## **19. A Deep Recurrent Framework for Cleaning Motion Capture Data**

**Utkarsh Mall**, G. Roshan Lal, Siddhartha Chaudhuri, Parag Chaudhuri  
ArXiv Preprint, 2017

## Academic Service

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### Reviewer

- CVPR: **Outstanding** Reviewer in 2021, Emergency Reviewer from 20-24 2020-25
- ICCV: Emergency Reviewer in 2021 2019-23
- 3DV: Emergency Reviewer in 2021 20-24
- ECCV: Emergency Reviewer in 20-24 20-24
- WACV: Emergency Reviewer in 2023 20-24
- NeurIPS (NeurIPS) 2020-24
- ICLR 2020-24
- ACCV 2020-22
- Machine Vision Applications (MVA) 2021
- AAAI 2019

### Workshop Reviewer

- Workshop on Computer Vision for Fashion, Art, and Design (at CVPR) 2021-23
- Workshop on Learning with Limited Labelled Data for Image and Video Understanding (at CVPR) 2022
- International Workshop and Challenge on People Analysis (at ECCV) 2022

### Invited Journal Reviewer

- IEEE Transactions on Multimedia 2020
- ISPRS Journal of Photogrammetry and Remote Sensing 2023

### Ph.D. Application Reviewer

- Computer Science, Cornell Univeristy 2022, 2023

### DEI Travel Grant Reviewer

- ECCV 2024

## Invited Talks

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NYU AI Summer School	Planet-Scale Discovery with Computer Vision	Jun, 2024
The New York Times	Remote Sensing Vision Language Models without Textual Annotations	May, 2024
UIUC	Visual Discovery from Spatio-Temporal Imagery	Sep, 2023
TCS Tech Summit	Discovering Events from Satellite Images	June, 2023
Columbia University	Visual Discovery from Spatio-Temporal Imagery	Feb, 2023
UC Berkeley	Visual Discovery from Spatio-Temporal Imagery	Mar, 2023
Cognitive Science at Cornell Univeristy	Field-Guide-Inspired Zero-Shot Learning	Mar, 2022
Pinterest Inc.	Discovering Events, Trends, and Neighborhood Maps with Fashion	Feb, 2022

## Teaching Experience

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### CS 5670: Introduction to Computer Vision

Teaching Assistant for Noah Snavely

Cornell Univeristy  
Spring 2018

Awarded **Outstanding TA**.

### CS 1620: Visual Imaging in the Electronic Age

Teaching Assistant for Don Greenberg

Cornell Univeristy  
Fall 2017

### CS 475/675: Computer Graphics

Teaching Assistant for Siddhartha Chaudhuri

IIT Bombay  
Fall 2016

### BB 101: Introduction to Biology

Teaching Assistant for Ambarish Kunwar, Ranjith Padinhateeri

IIT Bombay  
Fall 2014, Spring 2017

## Awards and Honors

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- Cornell Graduate Student Travel Grant 2019, 2022
- Cognitive Science Conference Grant 2022
- Outstanding TA Award, Cornell University 2018
- Gold Medalist at Indian National Physics Olympiad 2013
- Ranked 1st Regionally and 18th Nationally at Junior Mathematics Olympiad. 2011

## Press Coverage

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<i>TechXplore</i>	<i>AI tool detects global fashion trends</i>	2019
<i>Cornell Chronicle</i>	<i>'Underground maps' segment cities using fashion, AI</i>	2022
<i>Cornell Chronicle</i>	<i>Online retail images reveal skin tone discrepancies</i>	2022

## Work Experience

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### Discovering Underground Maps from Fashion

*Facebook AI Research*

POSTDOCTORAL RESEARCH SCIENTIST: ADVISOR - CARL VONDRICK

*Fall 2023 - Present*

Working on a several aspects of improving foundational vision models for expert domains such as interpretability, robustness, and generalization. Also working on applying these models to real-world scientific problems in collaboration with domain experts from climate scientists, crop scientists to fashion anthropologists.

### Discovering Underground Maps from Fashion

*Facebook AI Research*

RESEARCH INTERN: ADVISOR- KRISTEN GRAUMAN

*Summer and Fall 2020*

Developed a novel technique to discover underground neighborhood maps from clothing styles in social media images. Also introduced two non-visual benchmarks that capture the underground neighborhood notion of 37 worldwide cities, Introduced methods to discover meaningful insights (e.g., uniqueness, analogies, historical expansion) from the produced underground maps.

### Rule-Based Health Monitoring System

*Goldman Sachs Group, Inc.*

SUMMER ANALYST: MANAGER- SACHINDRA NATH

*Summer 2016*

Designed and Implemented a Rule Engine, allowing monitoring of running hosts, processes, and applications. The rule engine sends alerts about the health of the system, based on the rules matching with incoming telemetry data. Built REST endpoints and designed a web user interface on top of it, allowing users to manage rules.

### Data Visualization Web Applications

*Jeevomics Pvt. Ltd.*

SOFTWARE INTERN: MANAGER- ANKIT MALIK

*Winter 2014*

Developed web services to generate dynamic visualizations from diabetes diagnosis data. Used Google maps API and D3 to create the web application using a python-flask back end. Used a regularized regression model to fit data and find useful relations between metabolites concentration.

## Students Mentored

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<i>Lekha Revankar</i>	<i>PhD</i>	<i>Scale-Aware Recognition in Remote Sensing</i>	2023-2024
<i>Rajeev Datta</i>	<i>PhD</i>	<i>Change Event Recognition</i>	2024
<i>Chai-Hsiang Kao</i>	<i>PhD</i>	<i>Remote Sensing Question Answering Agents</i>	2024
<i>Sumit Sarin</i>	<i>Masters</i>	<i>Interpretability via Translation</i>	2023-2024
<i>Madhav Aggarwal</i>	<i>Masters</i>	<i>Disaster Event Detection</i>	2023-2024
<i>Naveen Reddy</i>	<i>Masters</i>	<i>Compositional Image Embeddings</i>	2024
<i>Snehal Bhagat</i>	<i>Masters</i>	<i>Efficient Change Event Detection</i>	2024
<i>Selina Xiao</i>	<i>Undergraduate</i>	<i>Generalization of Remote Sensing VLMs</i>	2024
<i>Jenny Jin</i>	<i>Undergraduate</i>	<i>Generalization of Remote Sensing VLMs</i>	2024
<i>Hangyu Zhou</i>	<i>Undergraduate</i>	<i>Cloud Detection and Removal</i>	2021-2024
<i>Aaron Yagnik</i>	<i>Undergraduate</i>	<i>VLM for LandSat Imagery</i>	2024
<i>Vipin Gunda</i>	<i>Undergraduate</i>	<i>User Interface for Satellite Image Search</i>	2024
<i>Anant Shyam</i>	<i>Undergraduate</i>	<i>VLM for LandSat Imagery</i>	2024
<i>JT Klenke</i>	<i>Undergraduate</i>	<i>Open-Vocabulary Segmentation</i>	2024

Arjun Mehta	Undergraduate	Open-Vocabulary Segmentation	2024
Kelsey Liu	Undergraduate	Benchmarks for Remote Sensing Recognition	2023
Brandon Kates	Undergraduate	Efficient Segmentation Annotation Tool	2019
Jang-Hyun Cho	Undergraduate	Unsupervised Segmentation	2019-2021
Hadi Alzayer	Undergraduate	Action Inference fro Place	2019-2022
Rachel Getman	Masters	Tracking Fine-Grained Fashion Trends	2018-2019
Sonia Appasamy	Undergraduate	Efficient Recognition Annotation Tool	2018-2019
Nehal Rawat	Undergraduate	Efficient Recognition Annotation Tool	2018-2019
Victoria Mao	Undergraduate	Domain Adaptation	2018
Arun Pidugu	Undergraduate	Dataset for Fashion in Art	2018
Rohit Bandaru	Undergraduate	Dataset for Fashion in Art	2018

## **Skills**

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**Programming Languages:** Python, C/C++, Java, Prolog, OCaml, R, Matlab

**Web/Application Development:** Python-Flask, Angular, Drools, Mongo, SQL

**Machine Learning:** Tensorflow, Torch, Lightning