

# Abhinav Java

## Microsoft Research

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## Education

**Delhi Technological University (DCE), India** Aug 2018 - Jul 2022  
Bachelor's of Technology in Computer Engineering (GPA: 8.87/10)  
> *Research Excellence Award, 2022.*

## Experience

**Microsoft Research, India** Aug 2024 - Present  
*Research Fellow with Srivathsan Koundinyan, Amit Sharma, Manik Varma*

**Adobe Inc. | Media & Data Science Research (MDSR), India** Aug 2022 - Aug 2024  
*Research Associate II with Mausoom Sarkar, Balaji Krishnamurthy*












**Adobe Inc. | Media & Data Science Research (MDSR), India** May 2021 - Aug 2022  
*Research Intern with Mausoom Sarkar, Balaji Krishnamurthy*

**Indian Institute of Technology Bombay, India** Sept 2020 - Mar 2021  
*Research Intern with Pankaj Singh, Ganesh Ramakrishnan*

**IDfy (Crime Check), India** May 2019 - Jul 2019  
*ML Intern with Gurudatt Bhohe*

## Selected Publications

\* denotes equal contribution

- [1] **ReEdit: Multimodal Exemplar-Based Image Editing**   
Ashutosh S\*, Tarun Ram\*, Abhinav Java\*, Avadhoot J, Silky Singh, Surgan Jandial, Balaji Krishnamurthy  
*Winter Conference on Applications of Computer Vision* [WACV '25]
- [2] **Towards Operationalizing Right to Data Protection**   
Abhinav Java\*, Simra Shahid\*, Chirag Agarwal  
*North American Chapter of the Association for Computational Linguistics* [Under Review, Positive Reviews]
- [3] **All Should Be Equal in the Eyes of LMs: Counterfactually Aware Fair Text Generation**    
Pragyan B\*, Abhinav Java\*, Surgan Jandial\*, Simra Shahid\*, Shaz F, Balaji Krishnamurthy, Sumit Bhatia  
*Association for the Advancement of Artificial Intelligence* [AAAI '24]
- [4] **Towards Fair Knowledge Distillation with Student Feedback**    
Abhinav Java\*, Surgan Jandial\*, Chirag Agarwal  
*International Conference on Machine Learning, Workshop on Efficient Systems for Foundation Models* [ICML ES-FoMo '23]
- [5] **One-Shot Doc Snippet Detection: Powering Search in Document Beyond Text**   
Abhinav Java\*, Shripad Deshmukh\*, Milan Aggarwal, Surgan Jandial, Mausoom Sarkar, Balaji Krishnamurthy.  
*Winter Conference on Applications of Computer Vision* [WACV '23]
- [6] **Learning to Censor by Noisy Sampling**    
Ayush Chopra, Abhinav Java, Abhishek Singh, Vivek Sharma, Ramesh Raskar  
*European Conference on Computer Vision* [ECCV '22]
- [7] **Rethinking Neural Networks with Benfords Law**    
Surya Kant Sahu, Abhinav Java, Arshad Shaikh, Yannic Kilcher  
*Neural Information Processing Systems, Workshop on Machine Learning and the Physical Sciences* [NeurIPS ML4PS '21]

## Featured Research Projects

**Multi Hop Reasoning for Retrieval Augmented Generation** Aug 2024 - Present  
*Advisors: Srivathsan Koundinyan, Amit Sharma, Manik Varma*  
*Microsoft Research*

- > Small Language Models (SLMs) struggle at multi-step reasoning and retrieval. [Working Paper]
- > Discovered that reasoning traces can improve retrieval recalls but don't improve generation at small scale.
- > Proposed a *reasoner module*, a policy LM optimized on the retriever reward model, improving efficiency by ~2.5x.

## A Model Agnostic Approach to Create Unlearnable Text Datasets

Mar 2024 - Present

Advisor: *Chirag Agarwal*

University of Virginia

- > Protecting public information on the web from being used to train LMs is critical from a policy perspective.
- > Proposed a simple mechanism to perturb sensitive datasets using information theoretic insights. [In Submission]
- > Demonstrated that finetuning large models like GPT-4o on our datasets drops their performance below zero shot level!

## Multimodal Foundation Model and AEM Forms

May 2021 - Aug 2024

Advisors: *Mausoom Sarkar, Balaji Krishnamurthy*

Adobe MDSR

- > Developed large document snippet search datasets to extend traditional document matching to multimodal setting.
- > Designed an architecture fusing vision, text, spatial cues to improve performance on PubLayNet (+12.83 mAP) [WACV'23]
- > Drove the Multimodal Foundation Model initiatives at MDSR, created task-enriched document instruction tuning datasets and optimized LLaVA attention for high-resolution image understanding.

## Protecting Private Information in 3D Point Clouds for Perception Tasks



Mar 2021 - Oct 2022

Advisors: *Ayush Chopra, Ramesh Raskar*

Camera Culture, MIT Media Lab

- > Perception tasks on 3D point clouds (e.g. medical scans) rely on a small, task-relevant subset of points.
- > These critical points may reveal sensitive attributes (e.g. race), hindering data sharing b/w untrusted sources.
- > Introduced an end-to-end task *invariant differentiable point cloud sampler* to enhance privacy-utility tradeoffs. [ECCV '22]

## Patents

- > Mask-CLIPstyler: Localized text-based style transfer in images (*to be filed by Nov 2024*)
- > One Shot Document Snippet Search (P11686-US · Filed Jun 30, 2023)
- > Personalized Form Error Correction Propagation (P12004-US · Filed Apr 27, 2023)
- > Form structure similarity detection (P11882-US · Filed Mar 27, 2023) 
- > Systems and methods for data augmentation (P11364-US · Filed Oct 11, 2022) 

## Honors and Awards

**Research Excellence Award, 2022** Awarded for undergraduate research during B.Tech (1 in 2000 students)

**Semester Merit Award, 2021** For securing University Rank 1 in the 5th Semester.

**University Football Team, 2018-2019** Won gold medal at IIT Kanpur Sports Fest.

**Intramural Sports, 2018, 2019, 2022** Co-led the department football team to first place.

**National Talent Search Exam, 2017** Qualified Stage 1 (5000 out of 1.2 Million across India)

**JENESYS Program, 2016** Selected by Central Board of Education for youth football-cultural exchange to Japan.

## Teaching and Leadership

**UAS-DTU (University Tech Team) [, ]** *Vice Captain, Software, Airframes Technician*

2019 - 2020

- > Secured funding from Adani Group by writing grants proposals and delivered presentations for lab (\$1M).
- > Participated in the IAF Mehar Baba Prize, and collectively developed a swarm solution with a 50km range.
- > Won the best communication architecture prize (INR 250K) for its use in disaster relief situation. [Media]

**Practical Introduction to Deep Learning** *UAS-DTU*

2019 - 2020

- > Taught basic programming and introduced deep learning to newcomers at Team UAS-DTU.
- > Interviewed candidates, designed assignments and quizzes for selection and teaching.


**Pre Placement Talk at DTU** *Adobe, MDSR*

Jul 2023

- > Delivered a talk on introduction to research as an undergraduate student. [Slides]
- > Facilitated an interactive panel with professors and students, fostering dialogue on research opportunities.

## Academic Service and Select Coursework

**Conference Reviewer** KDD '24, CVPR'24, U&ME@ECCV'24, WACV'23, ML4PS@NeurIPS'22, ECCV'22

**Invited Talk** Oral talk at AAAI '24 - Prompting for Debiasing LMs (Student Abstract) 

**Select Coursework** **Machine Learning:** Pattern Recognition, Computer Vision, Deep Learning, Natural Language Processing, CS231n-Stanford (MOOC), Deep Learning by Andrew Ng (Coursera). **Mathematics:** Discrete Math, Linear Algebra (NPTEL), Probability and Statistics (NPTEL). **Computer Science:** Object Oriented Prog., Data Structures, Algorithms, Software Eng.