

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] **Towards Operationalizing Right to Data Protection** 
[Abhinav Java*](#), [Simra Shahid*](#), [Chirag Agarwal](#)
North American Chapter of the Association for Computational Linguistics [NAACL '25]
- [2] **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]
- [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 $\sim 2.5x$.

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.