

# AAYAN YADAV

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🎓 [Google Scholar](#)

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🌐 [Portfolio](#)

## Education

\*GPA conversion to 4.0 scale done according to this website: <https://gpa.eng.uci.edu/node/158>

### Indian Institute of Technology, Roorkee

Oct. 2022 – May 2026

Bachelor of Technology in Data Science and Artificial Intelligence

Uttarakhand, India

CGPA : 9.03/10.0 (~ 3.75/4.0)\*

### Delhi Public School, Durgapur

April 2011 – Jun. 2022

Grade 12: 97.4%

West Bengal, India

## Experience

### AuraML | Research Intern (Hybrid)

April 2025 - August 2025

- Developed a scalable pipeline combining VLMs and graph diffusion models to generate and edit large 3D warehouse scenes from text prompts with efficiency and accuracy.

### Proteus Photos | Research Intern (Remote)

July 2024 - February 2025

- Built a classifier for detecting AI generated images. Improved upon SoTA classifier by finetuning contrastive language-image based encoder. Also experimented with some few shot techniques and adversarial training.

### University of Michigan | Research Collaboration (Remote)

September 2023 - March 2024

- Worked on refining instance segmentation masks of MS-COCO dataset and analysed its impact by training and benchmarking models. I also wrote and presented a full paper accepted at ECCV 2024 with my amazing coauthors.

## Publications

\* denotes equal contribution.

### Benchmarking Object Detectors with COCO: A New Path Forward

Shweta Singh\*, Aayan Yadav\*, Jitesh Jain, Humphrey Shi, Justin Johnson, Karan Desai

ECCV 2024

[\[Website\]](#)[\[Preprint\]](#)[\[GitHub\]](#)

- Created refined annotations for the COCO-2017 dataset to mitigate imperfections by leveraging the Segment Anything model and LVIS dataset in a semi-automatic pipeline.
- Benchmarked and trained object detectors on the new dataset, results aligned better with human judgement.

### StegaVision: Enhancing Steganography with Attention Mechanism (Student Abstract)

Abhinav Kumar, Pratham Singla, Aayan Yadav

AAAI 2025

[\[Preprint\]](#)[\[GitHub\]](#)

- Explored the impact of various attention mechanism i.e. channel and spatial and their permutations on encoder-decoder architecture for steganography.

### Provenance Detection for AI-Generated Images: Combining Perceptual Hashing, Homomorphic Encryption, and AI Detection Models

Under Review

Shree Singhi\*, Aayan Yadav\*, Aayush Gupta, Shahriar Ebrahimi, Parisa Hassanizadeh

[\[Preprint\]](#)[\[GitHub\]](#)

- A content provenance system to detect AI generated images. I worked on training adversarially robust binary classifier for the task. I leveraged embedding space of large self supervised vision-language models.

## Projects

### SLAFCoM: A Study on Loss Functions for Adversarial Finetuning of Contrastive Models [\[GitHub\]](#) April 2025

- Introduced a Clean Consistency Term in the loss function and experimented with different weights and learning rate to improve adversarial finetuning of contrastive models.

### Sirius | Pathway, OpenAI Swarm [\[GitHub\]](#)

November 2024

- Build an agentic RAG system using SoTA techniques like AdaRAG, PlanRAG, HyDE, SPLADE, MetRAG, RRF etc.

### MedMatcher | Google Colab, Pytorch, Hugging Face [\[GitHub\]](#)

December 2023

- Similar Document Template Matching for Medical Dataset. Fine-tuned LayoutLMv3 model on custom medical document dataset using weighted cross entropy loss and minibatch gradient descent.

### Image Captioning Model | Google Colab, Python, PyTorch, Pandas [\[Colab\]](#)

July 2023

- Build an image captioning model using transfer learning techniques on the Flickr8k dataset. We fine-tuned a combination of pretrained Inceptionv3 and LSTM with regularization.

### Papers We Read | Git [\[GitHub\]](#)

2023-2024

- Contributed summaries to this open source repository consisting of summaries of papers related to deep learning published in top conferences.

## Technical Skills

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**Languages:** Python, C++, SQL, HTML

**Technologies/Frameworks:** PyTorch, Numpy, Isaac Sim Blender, Pandas, Matplotlib, Detectron2, Jekyll

## Blogs

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**Dismantling Disentanglement in VAEs** | [\[Link\]](#)

September 2023

- A blog on disentanglement of latent space of VAEs.

**Activation Functions** | [\[Link\]](#)

March 2023

- A beginner level blog on activation functions.

## Achievements

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**All India Rank 1353, JEE Advanced 2022** *150k+ students in India take this for admission in IITs.*

**All India Rank 1962, JEE Main 2022** *1M+ students in India take this for JEE Advanced eligibility.*

**All India Rank 993, KVPY(SX) 2022** *KVPY is a highly prestigious national fellowship awarded by the Indian Institute of Science to students showing high aptitude in research.*

**All India Rank 84, WBJEE 2022** *150k+ Indian students take this for admission to colleges in West Bengal.*

**Recipient of NTSE Scholarship given by NCERT, 2021** *NTSE is a national-level examination for the secondary school level to identify and recognize students with high intellect and skills.*

## Extracurricular

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**Vision and Language Group, IIT Roorkee** | *Co-President*

March 2023 – Present

*Deep learning group on campus that organizes open discussions and projects related to deep learning.* [\[Website\]](#)

**Data Science Group, IIT Roorkee** | *Joint Seceretary*

April 2023 – Present

*Data Science and Machine Learning Group on campus that organizes workshops, talks and projects.* [\[Website\]](#)

**Geek Gazette, IIT Roorkee** | *Editorial Member*

November 2023 – Present

*Write articles in biannual magazine* [\[Website\]](#)

**Student Mentorship Program, IIT Roorkee** | *Mentor*

October 2024 – May 2025

*Mentored a group of freshers, helping them adjust to the university and guiding them.*

**National Social Summit, IIT Roorkee** | *Executive*

February 2023 – Mar 2023

*Helped organizing the prestigious summit.*

## References

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**Prof. Justin Johnson** | *Email: justincj@umich.edu*

United States

*Assistant Professor at University of Michigan | Co-founder at World Labs*

**Dr Karan Desai** | *Email: kdexd@umich.edu*

United States

*Ph.D. in CSE at Universtiy of Michigan | Member of Technical Staff at World Labs*

**Prof. Sanjeev Kumar** | *Email: sanjeev.kumar@ma.iitr.ac.in*

India

*HOD of Mehta Family School of Data Science and Artificial Intelligence, IIT Roorkee*

**Arjun Gupta** | *Email: cto@auraml.com*

India

*Co Founder & CTO at AuraML*