

AAYAN YADAV

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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 : 8.952/10.0 (~ 3.73/4.0)*

Delhi Public School, Durgapur

April 2011 – Jun. 2022

Grade 12: 97.4%

West Bengal, India

Experience

AuraML | Research Intern (Hybrid)

April 2025 - September 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 | 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 2025

- 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

Languages: Python, C++, SQL, HTML
Technologies/Frameworks: PyTorch, Numpy, Blender, Pandas, Matplotlib, Detectron2, Jekyll, ReactJS

Blogs

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

September 2023

 - A blog on disentanglement of latent space of VAEs.
- Activation Funtions | [\[Link\]](#)

March 2023

 - A beginner level blog on activation functions.

Achievements

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

- 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 magezine[\[Website\]](#)
- 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

- 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