

AAYAN YADAV

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Education

Indian Institute of Technology, Roorkee

Bachelor of Technology in Data Science and Artificial Intelligence

CGPA : 8.9/10.0 (~ 3.71/4.0)

Oct. 2022 – May 2026

Uttarakhand, India

Delhi Public School, Durgapur

Grade 12: 97.4%

April 2011 – Jun. 2022

West Bengal, India

Experience

Proteus | Remote [\[GitHub\]](#) [\[Website\]](#)

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.

Publications

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 50 pre-trained object detectors on the new validation set, resulting in a larger performance boost for more recent models and ranking flips leading to ranking that aligned more accurately with human judgement.
- Trained a Mask RCNN and Cascade RCNN models on cleaner annotations. We find that smaller models trained on cleaner annotations perform better than larger models trained on imperfect annotations, demonstrating that a better dataset leads to parameter efficiency.

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 adversially robust binary classifier for the task. I leveraged embedding space of large self supervised vision-language models.

Projects

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.

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.

Technical Skills

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

Technologies/Frameworks: PyTorch, Numpy, Pandas, Matplotlib, Detectron2, Jekyll, ReactJS

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 | *Project Head* **March 2023 – Present**
Deep learning group on campus that organizes open discussions and projects related to deep learning. [\[Website\]](#)

Data Science Group, IIT Roorkee | *Member* **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 [\[Website\]](#)

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: kdedx@umich.edu* **United States**
Ph.D. in CSE at Universtiy of Michigan | Member of Technical Staff at World Labs

Prof. Gopinatha N Pillai | *Email: gn.pillai@ee.iitr.ac.in* **India**
Professor at IIT Roorkee