

AAYAN YADAV

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Education

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

Experience

AuraML | Research Intern (Hybrid)

April 2025 - Present

- Using a combination of VLMs and Diffusion based techniques to generate 3D scenes from text.

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

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

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.

Technical Skills

Languages: Python, C++, SQL, HTML

Technologies/Frameworks: PyTorch, Numpy, Blender, 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 <i>Co-President</i> <i>Deep learning group on campus that organizes open discussions and projects related to deep learning.</i> [Website]	March 2023 – Present
Data Science Group, IIT Roorkee <i>Joint Seceretary</i> <i>Data Science and Machine Learning Group on campus that organizes workshops, talks and projects.</i> [Website]	April 2023 – Present
Geek Gazette, IIT Roorkee <i>Editorial Member</i> <i>Write articles in biannual magezine</i> [Website]	November 2023 – Present

References

Prof. Justin Johnson <i>Email: justincj@umich.edu</i> <i>Assistant Professor at University of Michigan Co-founder at World Labs</i>	United States
Dr Karan Desai <i>Email: kdedx@umich.edu</i> <i>Ph.D. in CSE at Universtiy of Michigan Member of Technical Staff at World Labs</i>	United States
Prof. Sanjeev Kumar <i>Email: sanjeev.kumar@ma.iitr.ac.in</i> <i>HOD of Mehta Family School of Data Science and Artificial Intelligence, IIT Roorkee</i>	India