

Jaisidh Singh

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Research interests	Computer vision, interpretability, foundation models, language	
Education	Indian Institute of Technology Jodhpur <i>B.Tech in AI and Data Science CGPA: 8.23/10, Department rank: 7.</i>	2020 - Present
	Courses: Deep Learning (A*), Dependable AI (A), Decision Making and Reinforcement Learning (A-), Artificial Intelligence (A-), Pattern Recognition and Machine Learning (A), Optimization for Machine Learning (A), Probability, Statistics and Stochastic Processes (A-), Linear Algebra and Differential Equations (A-), CS231N: Stanford Computer Vision*, Nvidia-DLI: Building Transformer Based Natural Language Applications*. *: indicates completion in self-learning mode.	
Publications	IdProv: Identity-Based Provenance for Synthetic Image Generation [Paper] [Poster] Harshil Bhatia*, Jaisidh Singh* , Gaurav Sangwan, Aparna Bharati, Richa Singh, Mayank Vatsa, AAAI Student Abstracts 2023	
Research Experience	Undergraduate Researcher: Trusted AI Lab @ IIT Jodhpur	July 2023 - Present
	<i>Mentors: Dr Aparna Bharati, Dr Richa Singh, Dr Mayank Vatsa</i> Leveraging rich knowledge of LLMs as cross-modal guidance to visual-language models. Working on ways of training-free enhancements of foundation models building towards AGI.	
	Research Intern: Bosch RTC Bangalore	April 2023 - Present
	<i>Mentor: Sonam Singh</i> Devised diffusion-based inpainting to test pedestrian edge cases in segmentation models. Using foundation models for interpretable failure discovery in semantic segmentation.	
	Undergraduate Researcher: Trusted AI Lab @ IIT Jodhpur	Jun 2022 - Jan 2023
	<i>Mentors: Dr Aparna Bharati, Dr Richa Singh, Dr Mayank Vatsa</i> Worked on tracing identity leakage in StyleGAN2. Developed a framework for the same utilizing latent space directions with face-matchers. Published at AAAI 2023 Student Abstracts.	
Technical Skills	Research Intern: Bosch RTC Bangalore	May 2022 - July 2022
	<i>Mentor: Sonam Singh</i> Investigated prompting strategies for CLIP in attribute-aware multimodal image retrieval. The framework developed was used for subsequent research and automation.	
	Programming languages: Python, LaTeX, JavaScript, Dart, Bash, C++ ML-DL frameworks: PyTorch, Tensorflow, HuggingFace, Flax, Scikit-learn Others: ReactJS, NodeJS, Flutter, Linux, Git, GraphQL	

Projects

Multimodal Diffusion Models for Inpainting [\[Code\]](#)

A plug-and-play framework developed while learning diffusion. Supports DDPMs, Stable Diffusion, and GLIGEN. Currently pursuing jigsaw puzzle solving with diffusion models as self-research.

UV-Summ: Frame Scoring Using UNet-like Transformers for Deep Video Summarization [\[Code\]](#) [\[Report\]](#)

An architecture for scoring CLIP frame features to extract key-frames. Outperformed previous works on the TvSumm dataset. Presented as the course project for Deep Learning 2023 @ IIT Jodhpur.

Beyond Token Limits: Inference-time Optimization for Large Document Summarization [\[Deployed\]](#) [\[Code\]](#) [\[Report\]](#)

A high-utility project for summarizing of large articles, in a purely inference-based, plug-and-play manner. Used hierarchical sentence clustering for extractive summarization. Presented as the DL-Ops project for Deep Learning 2023 @ IIT Jodhpur.

Deep RL: Agents on Gym and Custom Environments [\[Code\]](#) [\[Report\]](#)

Implementation of the DQN and Permutation Invariant Senory Transformer papers, tested on OpenAI's Gym. Used this learning to apply DQN for the course Project for Advanced Artificial Intelligence 2023 @ IIT Jodhpur.

LowResFormer: A Transformer for Low Resolution Fine Grained Image Classification [\[Code\]](#)

A vision transformer architecture developed as my first self-research endeavour. Utilized multimodal inputs of images along with attributes for classification. Outperformed previous approaches on the AwA2 dataset.

Achievements

Scored 170 in the GRE Quantitative section and 159 in the GRE Verbal section 2023.

Achieved 99.43 % percentile and 6428 rank out of 1.5 million applicants during JEE Mains 2020, with a rank of 3214 in JEE Advanced 2020.

Secured A* grade in Deep Learning 2023 course taught by Prof. Mayank Vatsa.

Secured top ranks in several regional level Olympiads. Awarded by with a laptop by SOF for the same.

Extra-curricular

I am a strong, decisive, rational, and reliable person, drawn towards roles which allow me to lead and help people. As a **Student Guide for SWC @ IIT Jodhpur (2021)** I assumed a continuous mentorship position to aid a group of 10 mentees both personally and professionally. Coordinated with a team of 46 to handle a batch of 500 students.

I am a seasoned guitarist, vocalist, and an avid reader, having a large spectrum of extra-curricular interests. These qualities made me a **Core Member in the Music Society, Quiz Society, Literature Society, AI and Applications Society, DevUp Labs @ IIT Jodhpur (2021)** where I performed at cultural events, and assumed collaborative and leadership roles for the coordination of activities and training of juniors.