Shreyans Jain

Second Year Undergraduate

Major in Artificial Intelligence · Major in Electrical Engineering · Indian Institute of Technology Gandhinagar

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ACADEMIC QUALIFICATIONS

Degree	Specialization	Institute	Year	CPI/%
B.Tech.	*Electrical Engineering*	IIT Gandhinagar	2022-Present	8.52/10
Class XII	*Physics, Chemistry, Maths*	Maa Bharti Sr.Sec.School, Swami Vivekanand Nagar	2021-2022	96%
Class X		FIITJEE World School, Secunderabad	2019-2020	10/10

PUBLICATIONS

Shreyans Jain, Mihir A., Ruchika M.,Nishita M., Himanshu S. (2024). "Suppressing Streak Artifacts Generated by the Interference of Imaging and Therapy Fields: Initial findings using a Hybrid U-Net and Diffusion Model" Accepted at Conference IEEE South Asian Ultrasonics Symposium 2024.

RESEARCH EXPERIENCE

Research Project, IISc Bangalore | Unlearning Concepts from Diffusion Models

Advisor ○ Prof. Prathosh A.P ○ Representation Learning Lab, IISc *May '24 - Ongoing*

- Developing a method for unlearning specific concepts from diffusion models with minimal interference in unrelated concepts by creating an adapter network and defining a novel loss function to reduce the likelihood of the concepts to be erased.

Research Project, IIT Gandhinagar | Streak Removal from High-Intensity Focused Ultrasound Images for Therapeutic Ultrasound

Advisor ○ Prof. Himanshu Shekhar○ MUSE Lab, IIT GN *December '23 - Ongoing*

- Developed a hybrid U-Net and Latent Diffusion Model to remove streak artifacts from B-mode ultrasound images during therapeutic interventions.
- Created a synthetic dataset with 1638 images for training, improving Signal-to-Noise ratio by 6.0 ± 3.4 dB on 154 test images. Demonstrated rapid model convergence, indicating potential for real-time clinical use.

Research Project, IIT Gandhinagar |Shadow Mitigation And Removal Technique using Encoded Reconstruction and Similarity Diffusion

Advisor ○ Prof. Shanmuganathan Raman○ CVIG Lab, IIT GN *January '24 - Ongoing*

- Implementing latest techniques in image processing based on transformers and diffusion models to remove partial-degradation due to shadows. Which can later be used for improving performance on downstream tasks like semantic segmentation and object detection.

INDUSTRIAL EXPERIENCE

AI Engineer, KrishiMandir

Advisors ○ Mr. Sumeet Mohanty, Mr. Noel Kurian *December '23 - Ongoing*

- Implementing, testing, and benchmarking various open-source Large Language Models (LLMs) and Retrieval-Augmented Generation (RAG) models to optimize Clojure function calling, enhancing both efficiency and accuracy.
- Developing Visual Similarity Search System achieving an accuracy of 96%, aiming to replace current OCR mechanisms employed in the company.

SELECTED PROJECTS

Visualisations for Machine Learning

Advisor ○ Prof. Nipun Batra○ Sustainability Lab, IIT GN ○ Project Link *July '23 - November '23*

- In collaboration with a team of three students, developed over 50 interactive machine learning educational tools like interactive blogs, and streamlit applications to visualize complex concepts and demystify the mathematics behind them.
- Focused on elucidating a range of topics including optimization, Markov chains, Fisher information, Shannon-Fano coding, JPEG compression, and CORDIC algorithms broadly covering Optimisation, Information Theory and Probability.

Bicycle Safety App for Android

Advisor ○ Prof. Nithin V George, Electrical Engineering ○ IIT GN *July '23 - November '23*

- The app employs phone sensors for real-time detection of over-speeding, falls, and geographical boundary breaches.
- Features safety measures, including automatic alarm notifications on both the child's and parents' devices in case of overspeeding, falling, or leaving a predefined geographic area. If the child doesn't confirm safety within 5 seconds of an alarm due to a fall, the system activates the child's phone microphone, allowing parents to listen in for response.

Multimodal Content Analysis and Generation for Social Media Platforms December '23-Ongoing

- Developed a sophisticated DNN for predicting the popularity of tweets (likes) using multimodal representation of data including timestamps, content, and images using ResNet-50 and Universal Sentence Encoder.
- Utilized BLIP for initial image-based captioning, enriching content with media insights, and then fine-tuned LLaMA-2 for enhanced tweet accuracy and relevance. This approach established a sophisticated pipeline, effectively combining image captioning and large language models to generate contextually rich and engaging tweets.

DC Anemometer

Advisor ○ Prof. Arup Lal Chakraborty, Electrical Engineering ○ IIT GN○ Project Link *March '23 - April '23*

- Developed an anemometer using a DC motor and Arduino UNO. This device operates on the principle that the generated voltage is directly proportional to the motor's rotational speed, enabling accurate wind speed measurement.
- Conducted Extensive Data Collection and cleaning and tested out various ML Algorithms and performed calibration in different test conditions.

TECHNICAL SKILLS

Languages: Python C++ C Bash

Tools: MATLAB LaTeX NanoHub Simulink Autodesk Inventor Azure AWS MetaSploit BurpSuite

Libraries: OpenCV Matplotlib Numpy Pandas Git Github

Frameworks: Keras Tensorflow Pytorch

ACHIEVEMENTS

- Awarded a Research Consultant position and cash prize by **WorldQuant** for achieving a top rank in the IITGN Alphathon.
- **Dean's List** award for excellent academic performance in Semesters I, II.
- **Secured 3rd position** in the CTF competition and **1st among first years** in the Machine Learning challenge in the Annual College Hackathon - HackRush
- Selected for **NATIONAL SQUAD** in Sailing.

RELEVANT COURSES

Completed Institute Courses: *Machine Learning, Control Systems, Digital Systems, Data Structures and Algorithms, Signals, Systems and Random Processes , Data-Centric-Computing, Probability Statistics and Data Visualisation, Electronic Devices, Electrical Machines, Ordinary Differential Equations, Linear Algebra, Calculus.*

Online Courses: *Certificate of Machine Learning courses from specialization by Deeplearning.ai on Coursera*

POSITIONS OF RESPONSIBILITY & EXTRACURRICULARS

Co-Licensee and Sponsorship Lead at TEDxIITGandhinagar *November '23 - Ongoing*

Leading a 70 member team to curate an impactful event featuring distinguished speakers while heading the Sponsorship efforts. My role involved strategic planning, team coordination, and fostering a platform for thought-provoking discussions and ideas.

General Member of The Technical Council *May '23 - Ongoing*

Involved in executing new initiatives, fostering external collaborations, and promoting the Council's role among students. My responsibilities included assisting technical clubs with project development and orchestrating various events, in a bid to improve the college's technical culture and student engagement in tech-related activities.

Core Member-Systems programming group *July '23 - Ongoing*

As a core member I spearheaded a CTF event with over 70 participants, I also administered a bWAPP environment, enhancing practical security learning. My role encompasses organizing and executing various cybersecurity competitions and events, contributing to community growth.