

# Hardik Jindal

Third Year Undergraduate  
Department of Electrical Engineering

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## Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2022-Present	B.Tech	Indian Institute of Technology Kanpur	<b>8.6/10</b>
2022	CBSE(XII)	Bharti Public School, Delhi	<b>94%</b>
2020	CBSE(X)	D.L.F Public School, Ghaziabad	<b>96%</b>

## Scholastic Achievements

- Secured **All India Rank 889** in JEE Advanced 2022 and **All India Rank 2257** in JEE Mains 2022.
- Secured **All India Rank 894** in **KVPY SX** conducted by IISc, Bangalore from over 1.5 Lakh qualified applicants.
- Secured **1st Position** in **SnT Hackathon 2023** conducted by **Science and Technology (SnT) Council**, IIT Kanpur
- Qualified for **1/8 finals** in IROS Simulation Humanoid Robot Wrestling Competition organized by **IEEE**.
- Received the **Dr. S.L. Batra Excellence Award** for exemplary academic performance in the academic year 2021-22.

## Work Experience

**Google Summer of Code'24** | Ceylon Computer Science Institute |  (May'24 - Present)

**Mentors:** Nipuna Weerasekara, Tingyuan Cui

- Implemented a **RAG-based** API for real-time retrieval of cyber news, utilizing web scraping techniques with **BeautifulSoup**.
- Transitioned the codebase to open LLMs like **Llama3**, **Gemma**, **MistralAI** by integrating a **HuggingFace-based** endpoint.
- Integrated **Langchain** to create an **LLM chain**, facilitating structured data processing and formatting for news handling.
- Deployed on **Gunicorn**, with **Pinecone** as the vector database for efficient storage and retrieval of data embeddings.
- Conducted **stress testing** and optimized API performance with **PyTest**, using unit, integration, and end-to-end tests.

**mSense AI** | Software Development Intern (Sep'23 - Nov'23)

- Extensively experimented with **PaddleOCR** and **EasyOCR** frameworks to create detection and recognition models.
- Conceptualized, implemented and integrated a **training pipeline** for **text classification** and **text detection**.
- Conducted comparative analysis of **preprocessing methods** to identify most effective techniques for **optimal model input**.

## Major Competitions

**IEEE IROS Humanoid Robot Wrestling Simulation Competition** | Team Humanoid, IITK |  (Aug'23 - Oct'23)

- Simulated a calibrated **NAO robot** and implemented a strategy for wrestling matches against other international teams.
- Integrated **YOLOv5 model** for recognizing the **position**, **depth**, and **spatial orientation** of the opponent in real-time.
- Implemented **image segmentation**, **contour detection** techniques for periphery detection and opponent detection.
- Worked on accessing positions in respect of global coordinate system by accessing global nodes in **WeBots environment**

**DevRev-AI Agent 007: Tooling up for Success** | Inter IIT Tech Meet 12.0 |  (Oct'23 - Dec'23)

Objective	● To create an optimal end-to-end pipeline for <b>tool manipulation</b> by open or closed LLMs.
Approach	● Finetuned the <b>LLaMA2 model</b> on our custom dataset to generate answers for input queries. ● Made a custom Retriever to retrieve tools within the LLM's context length in <b>LangChain</b> Expression Language. ● Utilized <b>FAISS(Facebook AI Similarity Search)</b> along with the <b>L2 Metric</b> for efficient data retrieval.
Result	● Achieved an <b>EM score of 64%</b> , with decent generalization to unseen examples. ● <b>Optimized</b> average inference cost to <b>USD 0.007</b> while using <b>GPT 3.5 Turbo</b> LLM.

## Key Projects

**AI-Based Cost Optimization in Indian Railways** | Prof. Gururaj Mirle Vishwanath (Aug'23 - Oct'23)

- Used **ensemble modeling** with **XGBoost** and **AdaBoost** to forecast railway loads, optimizing costs and power consumption.
- Applied **feature engineering** techniques such as **scaling**, **encoding**, and **feature selection** to improve model accuracy.
- Implemented **cross-validation** and **hyperparameter** tuning to enhance model robustness and performance.

**Generative Inpainting using Partial Convolutions** | Self Project |   (Feb'24)

- Developed a **UNet-like** architecture with **partial convolutional** layers for inpainting using PyTorch.
- Applied custom **L1**, **perceptual (VGG-16)**, style, and total variation losses for high-quality inpainting results.
- Trained on **ImageNet**, **Places2**, and **CelebA-HQ** datasets using the **Adam** optimizer and fine-tuned batch normalization.

## Technical Skills

- Programming Languages:** C | C++ | Python |  $\text{\LaTeX}$  | Bash | Rust
- Software/Libraries:** Numpy | Pandas | Matplotlib | Scikit-learn | Tensorflow | OpenCV | Git | LangChain | HuggingFace

## Positions of Responsibility

**Coordinator** | Programming Club (Apr'24 - Present)

- Managing a budget of **INR 80,000** allocated to the club for activities, workshops and projects to be conducted in the tenure.
- Leading a **two-tier** team structure comprising of **25 secretaries** to foster a culture of programming in the campus.

**Relevant Courses** (\*:Excellent Performance)

Fundamentals of Computing*	Data Structures and Algorithms	Probability and Statistics
Introduction to Electronics*	Linear Algebra	Control Systems and Analysis