

Harshit Dhankhar

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EDUCATION

- **Indian Institute of Technology (IIT), Patna** Patna, India
Bachelor of Science in Mathematics and Computing; CPI: 8.49 on 10.0 2021 – 2025 (Expected)
- **Amity International School, Mayur Vihar** New Delhi, India
Class 12th- CBSE Board; 96% 2019-2021

PROJECTS AND EXPERIENCE

- **Advanced Lab, CSE Department, IIT Patna** July 2023-Present
Undergraduate Researcher
 - Worked under the guidance of **Prof. Rajiv Misra**, Professor and HOD of CSE department at IIT Patna, on **CO2 forecasting using Deep Learning** techniques.
 - Conducted a literature review of CO2 emission of SAARC countries, existing DL algorithms like **LSTM, CNN-LSTM, LSTM with attention, etc.**
 - Solely worked in multi-variate time series data analysis and preprocessing using **statistical methods** like **FMOLS**, etc.
 - Worked in implementing DL methods like LSTMs, CNN-LSTMs, etc., for forecasting.
 - Work has been published under **2023 IEEE International Conference on BigData**.
 - Currently working on the implementation of **Deep-RL algorithms** like DQNs, DDPG, etc., for optimal routing and scheduling of EVs.
 - **Skills and Frameworks:** Deep Learning, Data Science, Statistics, LSTMs, Attention, Deep RL.
- **Computer Systems Group, IIIT Hyderabad** December 2022-Present
Research Intern
 - Worked under the guidance of **Dr. Tejas Bodas**, Assistant Professor at Computer Systems Group, IIIT Hyderabad, on **RL-based learning of indexable policies for Multi Armed Bandits (MABs)** and their applications in **scheduling**.
 - Conducted a literature review of existing indexable policies (Whittle's and Gittins' Index) for MABs as well as their application in **Queueing Theory**.
 - **Proposed a novel algorithm** for estimating Gittins' indices for MABs using Q-learning and Stochastic Approximation, **outperforming existing state-of-the-art-algorithms**.
 - Work is being documented for publication, with me being the **first author**.
 - **Skills and Frameworks:** Reinforcement Learning, Stochastic Optimisation, Artificial Intelligence, Queueing theory, Scheduling, Gittins' index, PPO, SAC.
- **Smart India Hackathon** May 2022-August 2022
Project
 - Worked on designing an **NLP-based model** to predict career paths for individuals using their resume.
 - This was integrated into the Django framework using PostgreSQL, proposing an end-to-end product.
 - **Runner up in our Problem Statement** among **30,000 competing teams**.
 - **Code:** <https://github.com/Harshit2807161/SIH-2022-DR710-PROSOL>.
 - **Skills and Frameworks:** NLP, Machine Learning, MATLAB, Data Science, Python and its modules, Pytorch.

- **Inter IIT Tech Meet, IIT Kanpur**

Participant

Jan 2023-Feb 2023

- Worked on devising a pipeline model based on **Computer Vision (CV)** to extract the patients' vitals from monitor images.
- Used state-of-the-art algorithms like **OpenCV, YOLOV5, InceptionV3, and OCR** in the pipeline.
- Was able to successfully get around 80% accuracy on the model.
- **Skills and Frameworks: Computer Vision, Image Processing, K-means, Keras.**

TECHNICAL SKILLS

- **Most experienced with:** C, C++, Linux OS, Python, R, Python libraries, Statistics, MATLAB, PyTorch, Deep Learning, Machine Learning, LaTeX, Open-AI gym, ML-Agents, Game theory, Queuing theory, Scheduling theory, Reinforcement Learning and Deep-RL: (DQN, DDQN, Policy based methods, etc.), Assembly language, VERILOG and Arduino programming.
- **Some experience with:** HTML, CSS, Git and GitHub.

COURSEWORK

Mathematics-I and II, **Data Science, Programming and Data Structures**, Algorithms, Real Analysis, Differential Equations, Discrete Mathematics, **Probability theory and random processes**, Numerical Linear Algebra, Computational lab, Computer Architecture, **Optimisation techniques**, Theory of Computation, **Financial Economics**.

ACHIEVEMENTS

- **Inter IIT Tech Meet, 2023- Silver Medalist:** Our team represented IIT Patna against all the 23 participating IITs at the 11th Inter IIT Technical Meet. Worked on building and deploying a **Bayesian network** to predict the **sustainability** score of various corporates through a dedicated modeller.
- **Sudo Override, 2022- 2nd position: CTF competition** under Celesta. Used Steganography, deciphering techniques and various Linux modules in Kali Linux and Ubuntu.
- **JEE Advanced:** Secured an **All India Rank of 4497** out of 140,000+ candidates who appeared for JEE Advanced, 2021.
- **JEE Mains:** Secured **99.57 percentile** of the 1 million+ candidates who appeared for JEE Mains, 2021.

INVOLVEMENT

- **TEDxIIT Patna**

Organiser

April 2023 - October 2023

Leading a team of 50 individuals to organise the fifth edition of TEDxIIT Patna. Work includes bringing in speakers, coordinating with sponsors, managing event logistics, etc.

- **NJACK-ML- Machine learning society, IIT Patna**

Sub-coordinator

October 2022 - June 2023

Involved in various group projects and worked to improve the ML culture at IIT Patna.

- **National Service Scheme, IIT Patna**

Volunteer

November 2021 - July 2022

Worked in organising primary education drive, blood donation drive, etc., throughout the year.

- **Celesta- Annual Techno-Management Fest, IIT Patna**

Sub-coordinator: Sponsorship

September 2022 - January 2023

My work included reaching out to MnCs across India, creating networks and pitching for sponsorships.

- **Forthright- Media Body, IIT Patna**

Senior Content Correspondent

April 2022 - July 2023

Worked in curation, drafting and editing of various articles.