Arnav Samal

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Education

National Institute of Technology, Rourkela, India May 2026
B.Tech. in Computer Science and Engineering *Current CGPA:* ***8.95***
SAI International School, Bhubaneswar, India July 2022
AISSCE (Science, PCM) *Percentage:* ***94.8%***

Coursework

Courses: Deep Learning - NPTEL, Natural Language Processing, Machine Learning, Probability & Statistics, Operating Systems, Database Engineering

Skills

Programming Languages: C, C++, Python, SQL
Libraries/Frameworks: PyTorch, HuggingFace, NLTK, SpaCy, Sci-kit Learn, SciPy, NumPy, Matplotlib, Flask
Tools: Git/GitHub, Conda, Docker, LaTeX, VS Code, Jupyter Notebook, Microsoft SQL Server
Languages: English, Hindi, Odia

Experience

NIT Rourkela | *Undergraduate Researcher, On-site* Oct. 2024 – Present

- Working under the guidance of **Prof. Tapas Kumar Mishra** on leveraging **LLMs** for **mathematical reasoning**, including proof generation, verification, and natural language explanation in systems like **Lean**.
- Collaborating on the application of LLMs to solve and explain **combinatorial problems** in **discrete mathematics**, focusing on improving interpretability and reasoning capabilities.

IIT Hyderabad | *Research Intern, On-site* May 2024 – Sept. 2024

- Worked under the supervision of **Prof. Konda Reddy Mopuri** on **Explainability in Vision Transformers**.
- Conducted an in-depth literature review and performed extensive experiments to measure **patch importance** and the overlay of **top-k tokens** between different blocks.
- Developed and proposed **post-hoc, model-agnostic explainability techniques** and **token pruning methods** to improve **image classification** interpretability.

Projects

NeurIPS - Ariel | *Python, SciPy, NumPy* Oct. 2024

- Developed a pipeline for exoplanet spectral prediction using calibrated multi-sensor time-series data, implementing **spatial-temporal aggregation**, **phase detection** via **gradient analysis**, and **Nelder-Mead optimization**.
- Ranked **257th/1,152** in the **NeurIPS-Ariel Challenge**, with an evaluation score of **0.5704**.

DeBERTa-ELL | *Python, PyTorch, HuggingFace Transformers* July 2024

- Developed a **DeBERTa-v3** model to assess English proficiency in high school essays, evaluating key aspects such as **cohesion, syntax, grammar**, and more through **full-parameter fine-tuning**.
- Implemented **multi-label stratified k-fold cross-validation** and achieved a final **MCRMSE** score of **0.4566**.

Achievements & Certifications

Ranked **5th** in the **Capsule Vision Challenge 2024**, organised by **CVIP 2024**.
Selected among **170 from 20,000+ applicants** for the **SURE program at IIT Hyderabad**
Ranked **2nd** position in **HackFest**, organised by **ML4E** for undergraduate students.
Awarded as **Kaggle Expert** (Datasets & Notebook)
Completed a **Deep Learning** & **Machine Learning Specialization** from **DeepLearning.AI**

Extracurricular Activities

Core Team Member, Research Division of **ML4E** (Machine Learning Club) at NIT Rourkela
Quizzer for **Inquizzitive** (Quizzing Society) at NIT Rourkela