

# PURBAYAN BHATTACHARJEE

+91 9038361750  
purbayan.00@gmail.com  
linkedin.com/in/purbayan-bhattacharjee



## SUMMARY

Early-career Machine Learning Engineer with hands-on experience in Python-based ML pipelines focused on data preprocessing, analysis, and deployment. Contributed to ISRO-funded research using Chandrayaan-2 and LADEE datasets, generating actionable insights and scientific visualizations. Developed a Geo-LSTM forecasting model that achieved an  $R^2$  score of 0.73 for urban heat prediction. Currently expanding C++ skills through LibTorch and Crow to improve inference performance, while leveraging Gradio and Streamlit for rapid ML prototyping and LLMs to accelerate learning, and to communicate results effectively.

## EDUCATION

### Narula Institute of Technology, Kolkata, India | Aug 2023 – May 2025

Master's Degree in Computer Science and Engineering (M.Tech)

- 7.47 CGPA
- Major Project: Urban Heat Island (UHI) Forecasting Model

### Narula Institute of Technology, Kolkata, India | Dec 2021 – July 2023

Master's Degree in Computer Applications (MCA)

- 8.54 DGPA
- Major Project: Blockchain-based chat application

## PUBLICATIONS

### In Search of Lunar Water at Northern Hemisphere

- Publisher: IEEE
- DOI: <https://doi.org/10.1109/CODEC60112.2023.10466209>

## SKILLS

- Python (ML & Backend)
- Data Preprocessing
- Data Analysis
- Gradio & Streamlit
- LLM-Assisted Learning

## WORK EXPERIENCE

### Research Intern – Planetary Science & Data Analysis

Narula Institute of Technology, Kolkata, India (On-Site) | May 2023 – Nov 2024

- Contributed to an ISRO-funded academic project titled “A Comprehensive Study of Sunlit Lunar Exosphere from CHACE 2 of Chandrayaan-2 Orbiter at Mid-Latitude Region”
- Cleaned and preprocessed large-scale lunar datasets using Python, NumPy, and Pandas to ensure data consistency and reliability
- Resolved signal noise, filled data gaps, and standardized formats across multi-source datasets (Chandrayaan-2, LADEE)
- Analyzed and visualized water vapor distribution patterns using Matplotlib and geospatial techniques
- Contributed to preliminary crater-based terrain analysis for Chandrayaan-3 landing site evaluation using Python-based image tools

## PROJECTS

### High-Performance Inference with C++ & LibTorch (2025, Ongoing)

- Learning to build low-latency ML inference APIs using LibTorch and Crow, focusing on performance through multithreading and memory optimization.

### Wildlife Object Detection and Classification using YOLOv12 (2025, Completed)

- Built and deployed a real-time animal detection system using YOLOv12 and Gradio; first deep learning project focused on object detection and classification in natural environments

### Urban Heat Island (UHI) Forecasting Model (2025, Completed)

- Developed a Geo-LSTM forecasting model that achieved an MAE of 1.61, RMSE of 1.94, and  $R^2$  of 0.73, outperforming traditional ARIMA and univariate LSTM baselines for urban heat prediction.

### Movie Recommendation System using TF-IDF (2022, Completed)

- Built and deployed a TF-IDF-based movie recommender using cosine similarity, with metadata preprocessing and TMDB API integration via Streamlit to explore ML recommendation workflows