

PURBAYAN BHATTACHARJEE

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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