



EDUCATION

Indian Institute of Technology Hyderabad

M.Sc. in Physics CGPA: 7.5

Expected July 2027

Hooghly Mohsin College (1836), West Bengal

B.Sc. in Physics CGPA: 7.28

August 2024

RESEARCH

Bayesian Optimization for Accelerator Parameter Tuning | Belle II Experiment, KEK, Japan

Ongoing

Python • Gaussian Processes • SHAP | Advisor: Prof. Sourav Sandilya, Belle II Collaboration

- Addressing the challenge of tuning multi-parameter accelerator systems under noisy, black-box objectives by implementing a Bayesian Optimization framework, motivated by injection-tuning methods at SuperKEKB (KEK).
- Engineering a Gaussian Process-based optimizer with EI/UCB acquisition functions, incorporating segmented region search, step-by-step parameter constraints, and proximal biasing to safely navigate noisy, non-convex parameter spaces.
- Benchmarking against random & grid search, and Nelder-Mead on simulated objectives, using SHAP to quantify per-parameter contribution.

PROJECTS

GNN-FraudNet | Graph-based Financial Fraud Detection

Completed

Python • PyTorch Geometric • FastAPI • XGBoost • Docker [GitHub](#)

- Addressed the challenge of detecting fraudulent Bitcoin transactions, where traditional ML models ignore transaction relationships, by developing a Graph Neural Network pipeline that leverages graph connectivity for node classification.
- Engineered a graph learning workflow on the Elliptic Bitcoin Dataset (203K+ transactions, 234K+ edges) using GraphSAGE and Graph Attention Networks (GAT), with preprocessing, class balancing, and explainability through SHAP and GNNExplainer.
- Built a production-ready inference pipeline by exposing fraud predictions through a FastAPI REST API and containerizing the application with Docker for scalable deployment.

Retail Demand Forecasting & Inventory Optimization

Ongoing

Python • LightGBM • Time Series Forecasting [GitHub](#)

- Solved the problem of retail demand forecasting by building a scalable SKU-level sales prediction pipeline using LightGBM, enabling accurate inventory planning across multiple stores.
- Designed advanced time-series features including lag, rolling-window, calendar, promotion, and holiday variables, and benchmarked the model against SARIMA and Prophet baselines using time-aware cross-validation.
- Implemented hierarchical forecast reconciliation to maintain consistency across SKU, store, and regional forecasts, improving the usability of predictions for supply chain and inventory decision-making.

Spam Classification from Scratch

Completed

Python • NumPy • Machine Learning [GitHub](#)

- Built a machine learning pipeline from scratch to detect spam SMS messages, implementing Multinomial Naive Bayes and Logistic Regression without using scikit-learn or other ML libraries.
- Implemented custom Bag-of-Words, TF-IDF, MLE, Laplace smoothing, gradient descent, and end-to-end evaluation metrics (ROC, AUC, F1) while ensuring data-leakage-free feature engineering.
- Achieved 94.9% F1-score and 0.982 AUC on the UCI SMS Spam Collection, demonstrating strong performance through threshold optimization and comparative model analysis.

POSITIONS OF RESPONSIBILITY

Placement Coordinator, Office of Career Services, IIT Hyderabad

May 2026 – Present

Manage end-to-end campus recruitment drives and liaise with recruiters; onboarded companies including IBM, Licious, HCL.

Inbound & Logistics, International Relations Cell, IIT Hyderabad

Sep 2025 – Present

Coordinate orientations, cultural programs, and academic tours for exchange students from Japan, international delegates, and company officials.

Design Core, Extra Mural Lectures (EML), IIT Hyderabad

May 2026 – Present

Lead visual design and event branding for EML; hosted NASA Axiom Mission Pilot Subhanshu Shukla for a campus lecture.

SKILLS

Languages & Tools: Python, SQL, Git, NumPy, Pandas, PyTorch, PyTorch Geometric, LightGBM, basf2

Domain: Machine Learning, Graph Neural Networks, A/B Testing & Experimentation, Time Series Forecasting, Data Science, Data Structures & Algorithms

Coding Practice: LeetCode, GeeksforGeeks, Striver A2Z, Codeforces

RELEVANT COURSES

Machine Learning for Physical Sciences • Machine Learning for High Energy Physics • Statistical Mechanics • Linear Algebra • Computational Physics • Data Science Analysis

CERTIFICATIONS

Machine Learning Specialization – DeepLearning.AI / Coursera

COMPETITIONS

Accenture Innovation Challenge 2026

Selected Finalist

Designed a GNN-based digital twin for vehicle assembly line optimization, modeling stations and workflow dependencies as graph structures to predict bottlenecks and throughput issues, applying graph representation learning techniques from concurrent Belle II / GNN-FraudNet research.