PREM DEV

Bachelor of Technology
Bioscience and BioEngineering
MINOR:- DATA SCIENCE
INDIAN INSTITUTE OF TECHNOLOGY JODHPUR

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Strong expertise in Python, C++, and financial modeling, specializing in ML-driven trading strategies and low-latency optimization. Proven experience in volatility modeling, sentiment-based stock prediction, and algorithmic execution. Passionate about leveraging AI, statistics, and data structures to build cutting-edge solutions.

Education

B.Tech in Bioscience and Bioengineering — Aug 2022 - May 2026
Indian Institute of Technology, Jodhpur — CGPA: 7(till 5th sem)

- **Significant Coursework:** Deep learning, Applied Advanced Machine Learning, Mathematics, Probability statistics and stochastic processes
- **Minor Degree:** Data Science
- Class Representative, IIT Jodhpur (2022-2024) – Represented students, coordinated with faculty, and addressed academic concerns

Senior Secondary — Apr 2020 - Mar 2021
Co-Ed Sr. Sec School (CBSE Board) — GPA: 90.00%

- Among the top 5 students in the class.

Secondary — Apr 2018 - Mar 2019
Gyan Jyoti Public Sr. Sec School (CBSE Board) — GPA: 89.6%

- Secured Delhi State Rank 68 in the Global Science Olympiad. Link

Projects

Stock Price Prediction Model Using Sentiment Analysis — Feb 2025 - March 2025 (Link)

- Achieved 72.4% directional accuracy in SPY price predictions using hybrid CNN-LSTM with attention mechanisms, outperforming ARIMA baseline (58.1%).
- Optimized model with Huber loss (=1.0) and Adam (lr=0.0005, clipvalue=1.0), reducing MSE to 112.5 vs baseline 1193.3.
- Deployed quant strategy achieving 1.68 Sharpe ratio and 18.7% max drawdown using Bollinger Bands (=2), RSI (14), and OBV signals.
- Key Technical Components: TensorFlow, PyTorch, ONNX Runtime, Quantized TFLite, Mixed Precision Training, FinBERT Sentiment, Huber Loss Optimization, MinMaxScaler, AWS Batch Inference.

ExoVol: Advanced Volatility Surface Modeling & Forecasting Tool — Jan 2025 - Mar 2025 (Link)

- Developed ExoVol, an advanced volatility surface modeling tool integrating VAE-LSTM deep learning models for options market forecasting.
- Engineered a high-performance pipeline handling 100,000+ data points, optimized with Optuna, achieving $R^2 = 0.87$ and 12% lower RMSE than standard LSTMs.
- Accelerated inference speed by 30% using TensorFlow Lite, reducing training time by 20% through hyperparameter tuning and edge device optimization.

Minor Projects — Jul 2023 - Mar 2024

1. **Consensus-based Node Joining Payment Channel Network** (Feb 2024 - Mar 2024)
   Supervisor: Prof. Awathare Nitin Niranjan, Department of Computer Science & Engineering, IIT Jodhpur
   Developed Lightning Network node algorithms using Bitcoin LND and Go, enhancing scalability and throughput by 10-20%.
2. **Prototype for SSO for IITJ** (Sep 2023 - Dec 2023)
   Mentor: Jayanta Borthakur, Manager (ICT) - Networking, IIT Jodhpur
   Developed a full-stack SSO prototype integrating Keycloak and miniOrange, reducing login time by 40% and enhancing API integration efficiency by 30%.
3. **Exam Scheduling: A Graph Coloring Approach** (Link) — Jul 2023 - Nov 2023
   Developed an exam scheduling algorithm integrating graph coloring, genetic algorithms, and ILP, reducing conflicts by 40-50%, improving efficiency and cutting scheduling time by 60%.

Predictive Histopathologic Cancer Detection using Machine Learning — Aug 2023 - Oct 2023 (Link)

- Developed a Convolutional Neural Network (CNN) using Python and TensorFlow/Keras for histopathologic cancer detection.
- Utilized a dataset of 220,025 training images and 57,468 test images, labeled for tumor presence.
- Achieved a validation accuracy of 94.40% after 20 epochs, with training loss at 0.3161 and validation loss at 0.4177.

Certifications

- **Financial Markets by Yale University** — Credential Link

Work Experience

Data Analyst Internship Jul 2024 - Aug 2024

InternQ India, India Certificate Link

- Developed statistical models and automated data processing in Python, reducing manual effort by 30%.
- Optimized data retrieval from large datasets and created visualizations to communicate insights.
- Applied machine learning algorithms for predictive analytics.

Active Member, Cyber Security Contingent Oct 2023 - Dec 2023

Indian Institute of Technology Jodhpur (IIT Jodhpur), India

- Collaborated with team to represent IIT Jodhpur in the Inter-IIT Tech Meet, secured a remarkable 5th position.

Marketing Assistant Head Jan 2023 - Apr 2023

IIT Jodhpur, Jodhpur, India

- Spearheaded outreach initiatives, negotiated partnerships, and secured 25% more sponsorship funding, elevating brand visibility.
- Directed cross-functional teams, optimized marketing strategies, and expanded audience reach by 3/5, driving 40% growth in event participation.

Skills

AI/ML Frameworks: PyTorch, TensorFlow, Scikit-Learn, Pandas, NumPy, Matplotlib, Optuna

Programming & Scripting: Python, C/C++, Java, MATLAB, Bash

Financial Modeling: Time-Series Analysis, Monte Carlo Simulation, Black-Scholes Model, VaR

Data Structures & Algorithms: Graph Algorithms, Dynamic Programming, Low-Latency Optimization

Web & Full-Stack Development: RESTful API integration, Agile Prototyping, SSO System Development

Software & Tools: Git, Linux, Docker (basics), React, TypeScript, PostgreSQL, Kubernetes

Soft Skills: Leadership, Analytical & Strategic Thinking, Problem-Solving, Adaptability, Rapid Prototyping

Languages

Hindi (Native proficiency) •English (Full professional proficiency)