Aditi Gupta

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Education

Vellore Institute of Technology (VIT) **Bhopal, India**
B.Tech in Computer Science and Engineering (AI & ML Specialization) Aug 2023 - Jun 2027
Current CGPA: 8.81/10
DAV Public School, Gurugram - Grade XII, 93.2% **Apr 2022 - Mar 2023**
Delhi Public School, Gurugram - Grade X, 92.6% **Apr 2020 - Mar 2021**

Technical Skills

- **Programming Languages:** Python, C++, Java, SQL
- **Data Science:** Machine Learning, Deep Learning
- **Deployment & Cloud:** AWS, Flask, Render,
- **Version Control & Tools:** Git, GitHub, Jupyter Notebook, VS Code, DWSIM, LaTeX
- **Coursework:** DSA, OOP, OS, DBMS, Linear Algebra

Experience

FOSSEE, IIT Bombay (Remote) Oct 2025 – Present
Machine Learning Intern
- Implementing ANN based model for Crude Oil Characterization, addressing the limitations of traditional refinery analysis by developing a predictive model that estimates crude properties faster and more accurately than existing mathematical correlations.
- Contributing to FOSSEE's open-source engineering modeling initiatives, focusing on process simulation.

Projects

Surrogate Modelling for Binary Distillation Sep 2025
Surrogate Modeling and Process Simulation with DWSIM
- Engineered a high-fidelity Binary Distillation Surrogate Model using XGBoost to predict distillate purity (x_D) and reboiler duty (Q_R), achieving superior performance with $R^2 \approx 0.95$ and 0.93 respectively.
- Generated and rigorously curated a 373-sample dataset using DWSIM process simulations, applying comprehensive data cleaning, validation, and unit consistency checks to ensure data quality.
- Designed and deployed a robust, reproducible ML pipeline that automated preprocessing, feature scaling, categorical encoding, and model optimization using RandomizedSearchCV.
- Validated model extrapolation capability using a block-based holdout strategy on unseen operating regions; conducted feature importance and diagnostic analyses to identify Reflux Ratio, Boilup Ratio, and Feed Mole Fraction as critical drivers of separation and energy demand.
- Tools: **Python (Pandas, NumPy, Scikit-learn), XGBoost, Matplotlib, Seaborn, DWSIM.**

Student Performance Predictor Sep 2025
End-to-End Machine Learning Pipeline and Deployment
- Developed an end-to-end machine learning system to predict student performance, structuring the code into modular components (Data Ingestion, Transformation, Model Training) to ensure scalability and reproducibility.
- Engineered a robust data processing pipeline using Scikit-Learn and Pandas to automate feature scaling (StandardScaler), categorical encoding (OneHotEncoder), and handling of missing values, ensuring consistent input for both training and inference.
- Developed more than 10 regression algorithms (including CatBoost, XGBoost, and Ridge), optimizing hyperparameters via GridSearchCV to achieve a top-performing R^2 score of 0.88.
- Deployed the model using Flask and Render, integrating custom logging and exception handling to monitor application stability in a production environment.
- Tools: **Python (Pandas, NumPy), Scikit-learn (ColumnTransformer, Pipeline), CatBoost, XGBoost, Ridge, Lasso Regression, GridSearchCV, Flask, Render**

Leadership & Extracurricular Activities

- Served as **Head Girl** at Delhi Public School; represented student body and coordinated school-wide initiatives.
- Served as **Mother Teresa House Captain**; led team to win the House Cup by organizing and motivating peers in competitions.