

Om Mishra

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PROJECTS

PulmoScan AI: High-Sensitivity Pneumonia Screening Tool | *PyTorch, Streamlit, OpenCV* GitHub | App

- Engineered a medical diagnostic system to detect pneumonia from chest X-rays, explicitly prioritizing **Recall (Sensitivity)** to minimize false negatives in clinical screening.
- Fine-tuned and benchmarked **DenseNet121** against ResNet50, achieving **99.7% Recall** (vs. 97.0%) and reducing missed pneumonia cases from 11 to 1.
- Implemented **Explainable AI (Grad-CAM)** with bicubic interpolation to visualize lung opacities and ensure transparent predictions.
- Built a full-stack Streamlit app with real-time inference, model hot-swapping, and caching, reducing inference latency by **80%**.

Urban Mobility Optimization: Bike Demand Prediction | *Python, Scikit-learn, SHAP* GitHub | App

- Developed an end-to-end ML system to predict hourly bike-sharing demand, achieving **R² = 0.935** for proactive inventory rebalancing.
- Evaluated 7 regression models and selected a tuned **LightGBM regressor** with zero overfitting.
- Engineered time-aware features using cyclic encoding and log-transformation to correct skewed demand distributions.
- Applied **SHAP** to identify key demand drivers and translate insights into actionable business strategies.

Telecom Customer Churn Prediction | *Python, Pandas, Scikit-learn, Streamlit* GitHub | App

- Built a full classification pipeline on ~7,000 customer records with EDA and feature engineering to identify churn drivers.
- Trained and compared 8 ML models, selecting **Logistic Regression** for business-critical Recall = **80.9%** and ROC-AUC = 0.75.
- Deployed a Streamlit application for churn scoring, batch predictions, and retention-focused decision support.

Neural Networks: Visualizing Forward & Backward Propagation | *HTML, CSS* GitHub | App

- Built an interactive educational web app explaining forward propagation, loss computation, and backpropagation via animated neurons and gradients.
- Integrated MathJax-based derivations to dynamically demonstrate weight updates and gradient descent.
- Designed smooth SVG and CSS animations to improve conceptual clarity of ANN internals.

TECHNICAL SKILLS

Languages: Python, SQL

Machine Learning & Deep Learning: PyTorch, scikit-learn, CNNs, Transfer Learning

Data Analysis & Visualization: NumPy, Pandas, Matplotlib, Seaborn, Plotly

Computer Vision & XAI: OpenCV, Grad-CAM, SHAP

Deployment & Tools: Streamlit, FastAPI (basic), Git, GitHub, Linux, VS Code

EDUCATION

Smt. C.H.M. College

Bachelor of Science in Information Technology

Ulhasnagar, Maharashtra

2024 – Present