

Fraud Detection System for Financial Transaction

Resources:

Dataset Link:

<https://www.kaggle.com/datasets/ealaxi/paysim1>

GitHub Repository:

<https://github.com/PRIYAtechky/Fraud-Detection-System-for-Financial-Transaction>

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PROBLEM STATEMENT :

- Financial institutions face challenges in detecting and preventing fraudulent transactions.
- UPI-based financial fraud leads to significant monetary losses.
- Evidence: Increasing fraud cases and financial losses in digital transactions.

SOLUTION APPROACH :

- **Develop an ML Model** – Analyze transaction patterns to detect fraud in real time.
- **Scalability** – Ensure the system can handle large transaction volumes efficiently.
- **Adaptive Learning** – Continuously update the model to detect new fraud patterns.
- **Alerts & Verification** – Notify users via email/SMS and send OTP for verification if fraud is suspected.

TECHNOLOGY & MODELS USED :

Machine Learning Models:

- Logistic Regression
- Decision Tree
- K-Nearest Neighbors (KNN)
- Random Forest
- Naïve Bayes
- XGBoost (Best Performing)

Technology Stack:

- Python, Flask (Web App), Pandas, Scikit-learn, XGBoost

IMPLEMENTATION :

➤ Dataset Features:

- Transaction type, amount, source & destination balances, timestamp

➤ Preprocessing:

- Feature engineering, normalization using scaler.pkl

➤ Model Training & Evaluation:

- Trained on historical transaction data
- Best accuracy achieved using XGBoost

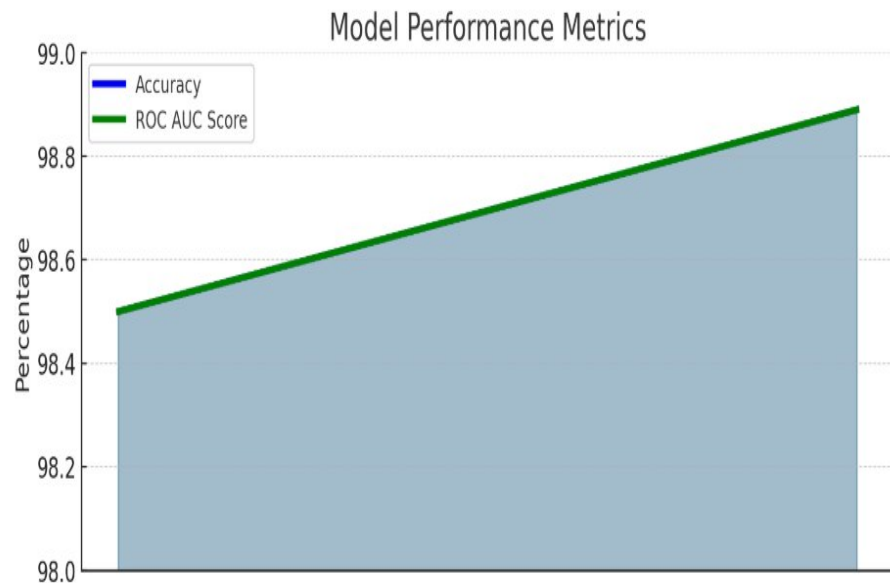
MODEL PERFORMANCE:

➤ Evaluation Metrics (Test Set):

- Accuracy: 98.89%
- F1 Score: 98.90%
- ROC AUC Score: 98.89%

➤ Feature Importance:

- Most important: diffOrg, oldbalanceOrg, amount, newbalanceDest
- Least contributing: isFlaggedFraud



PREDICTION FORM :

Fraud Detection Form

Step:

50

Amount:

1000

Old Balance Before Transaction:

5000

New Balance After Transaction:

4000

Old Balance Of Recipient:

2000

New Balance Of Recipient:

3000

Type:

PAYMENT

Predict

Prediction: Not Fraud

Fraud Detection Form

Step:

100

Amount:

500000

Old Balance Before Transaction:

100000

New Balance After Transaction:

100000

Old Balance Of Recipient:

0

New Balance Of Recipient:

0

Type:

TRANSFER

Predict

Prediction: Fraud

CONCLUSION & FUTURE ENHANCEMENTS :

- This model detects fraud using historical transaction data and enhances security by sending email/SMS alerts and OTP verification when fraudulent activity is detected.
- It integrates with financial institutions for real-time alerts and continuously updates to counter evolving fraud tactics.