Credit Card Fraud Detection

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Metis

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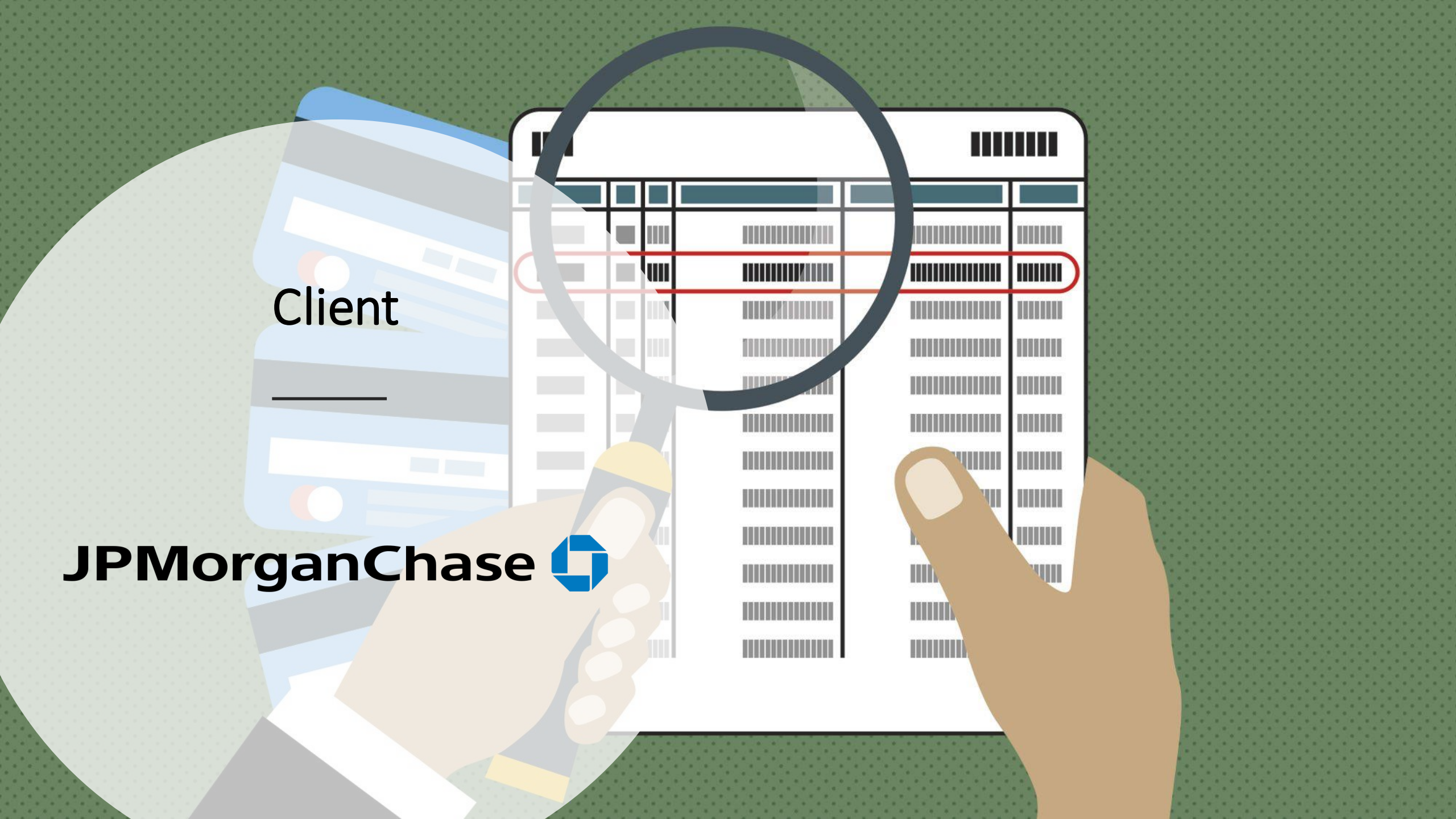
161%

of credit card fraud occurrences have increased between 2015 – 2020, according to Atlas VPN.


Client
JPMorganChase

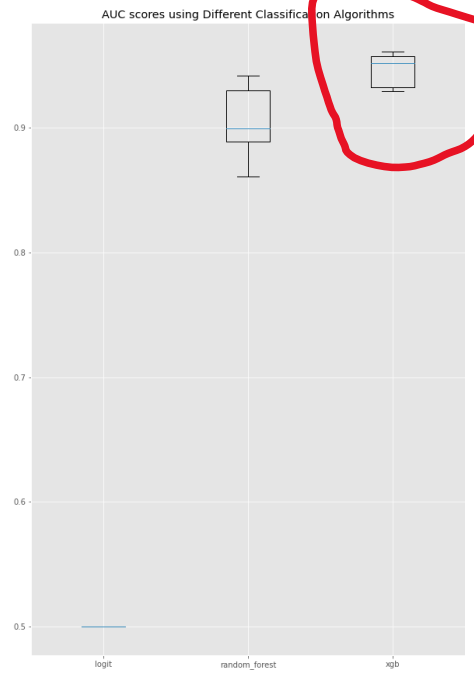
Solution: Credit Card Fraud Classifier

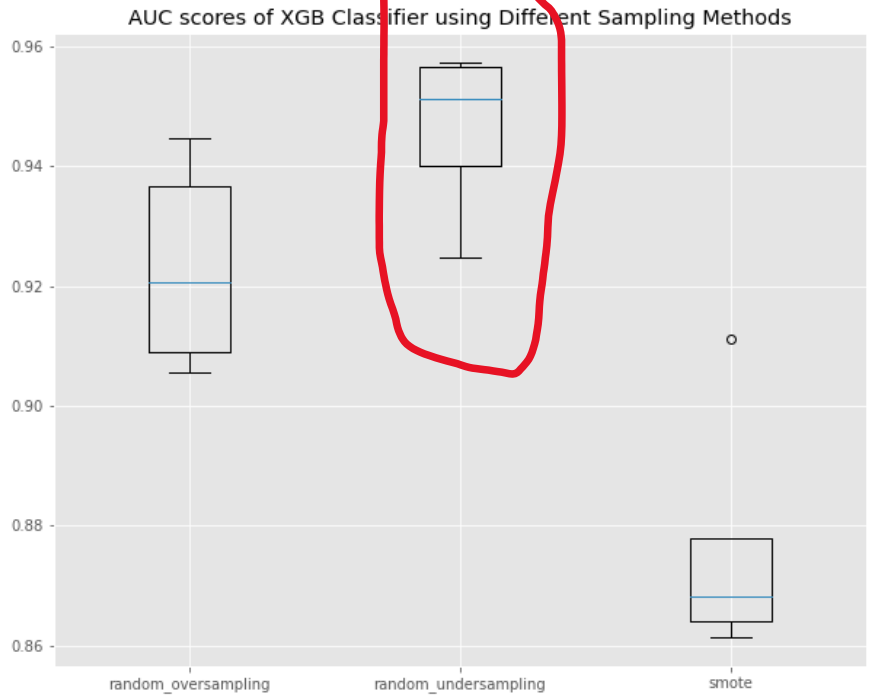
to automatically classify whether a transaction is fraudulent or valid using a computer program

Solution Path to find the Best Classifier

Metric	•Determine suitable metric – AUC ROC SCORE
Balance Data	•Stratify function during Train, Val, Test stage •Compare sampling methods: undersampled, oversampled, and SMOTE (Synthetic Minority Oversampling Technique)
Compare Classifiers	•Compare 3 different classifiers •Logistic Regression •Random Forest •Gradient Boost
Optimize Final Classifier	•Tuning its hyperparameters using Hyperopt

Best Classifier: Gradient Boost w/ Under Sampling

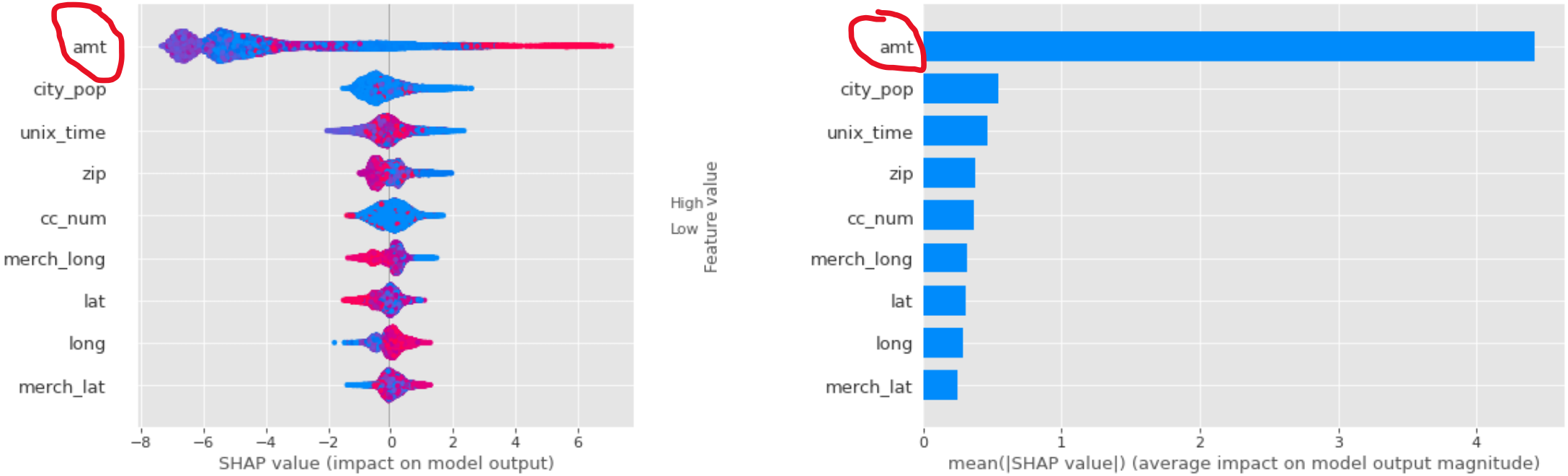




Final Classifier Model Performance:

AUC SCORE = .95

Feature Importance: Amount



Cost Benefit Analysis

- Cost – Positive Number
- Benefit – Negative Number

TN (Normal Transaction):	C_{TP} = -1 x Transaction Amount x Merchant Fee
FP (Falsely Flagged Fraud):	C_{FP} = Intervention Cost – Transaction Amount x Merchant Fee+ Customer Frustration
FN (Undetected Fraud):	C_{FN} = Transaction Amount
TP (Detected Fraud):	C_{TP} = Intervention Cost

Source: RCG Global Services

Actionable Insights

Group

Group Amount feature in varying amounts

Set

Set Amount threshold that triggers the classifier

Flag

Flag small sequential amounts in a short period of time

Explore

Explore Customer Frustration as a Metric