

# CatchPhish

An ML Approach to URL Phishing Detection

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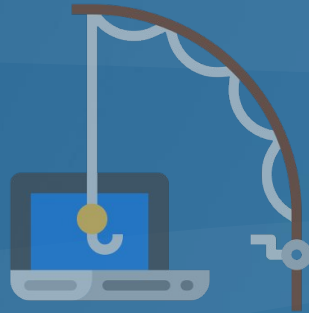
# The Problem



- Cybercrime is on the rise.
- Small to Medium Businesses (SMB's) account for 43% of all cyber attacks.
- 95% of all cyber breaches are attributed to human error.



# What is Phishing?

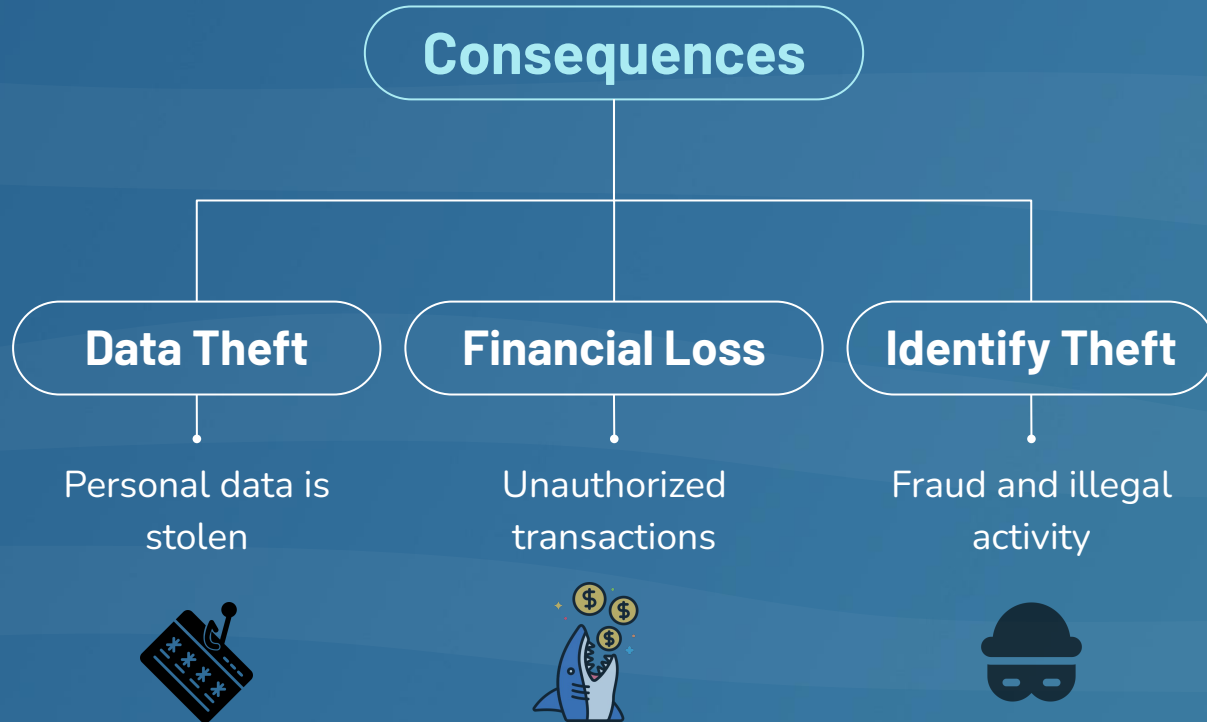


# Don't We Already Have a Solution For This?

- More layers more protection
- SMB's struggle to adopt effective security
  - Lack of education
  - Cost
  - Optimism Bias
- SMB's are the best phish!



# Impact of a Phishing Attack



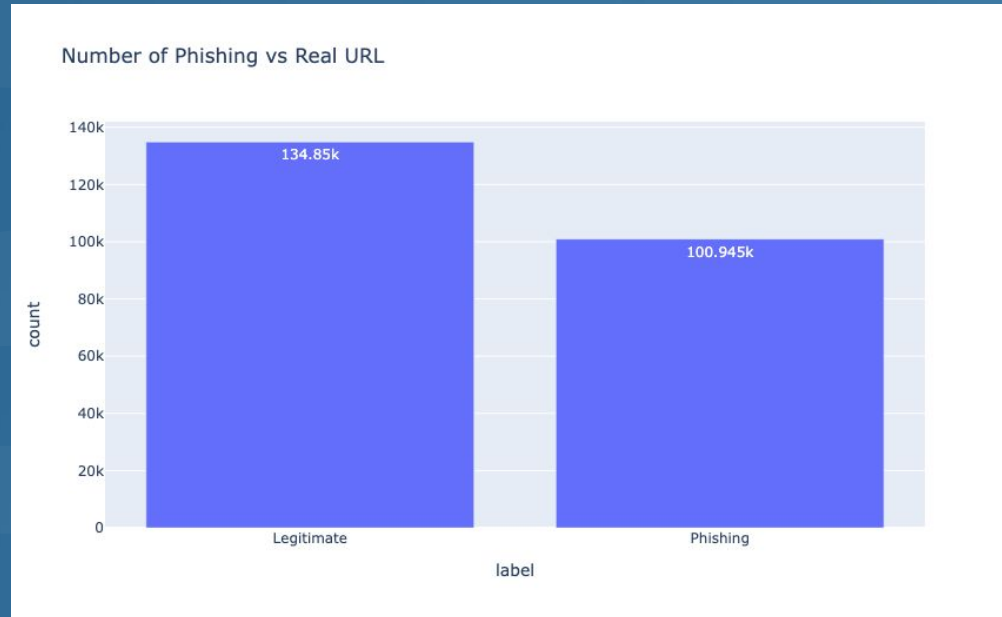
# The Impact of The Solution

- Financial Protection.
- Preservation of Reputation and Customer Trust.
- Reduce Downtime and Improve Productivity.



# Understanding The Data

- The dataset contains 235,795 rows and 56 features.
  - 50 Feature Engineered by Data Engineer
  - Clean Dataset (no nulls or duplicates)



# Preprocessing



Variance  
Thresholding

Correlation  
Analysis

Intercorrelation  
Analysis

Feature  
Importance





# Findings From EDA

- A lot of inter collinearity
  - Total features reduced 10
- Features have extremely high predictive power



# Preliminary Model

## Logistic Regression

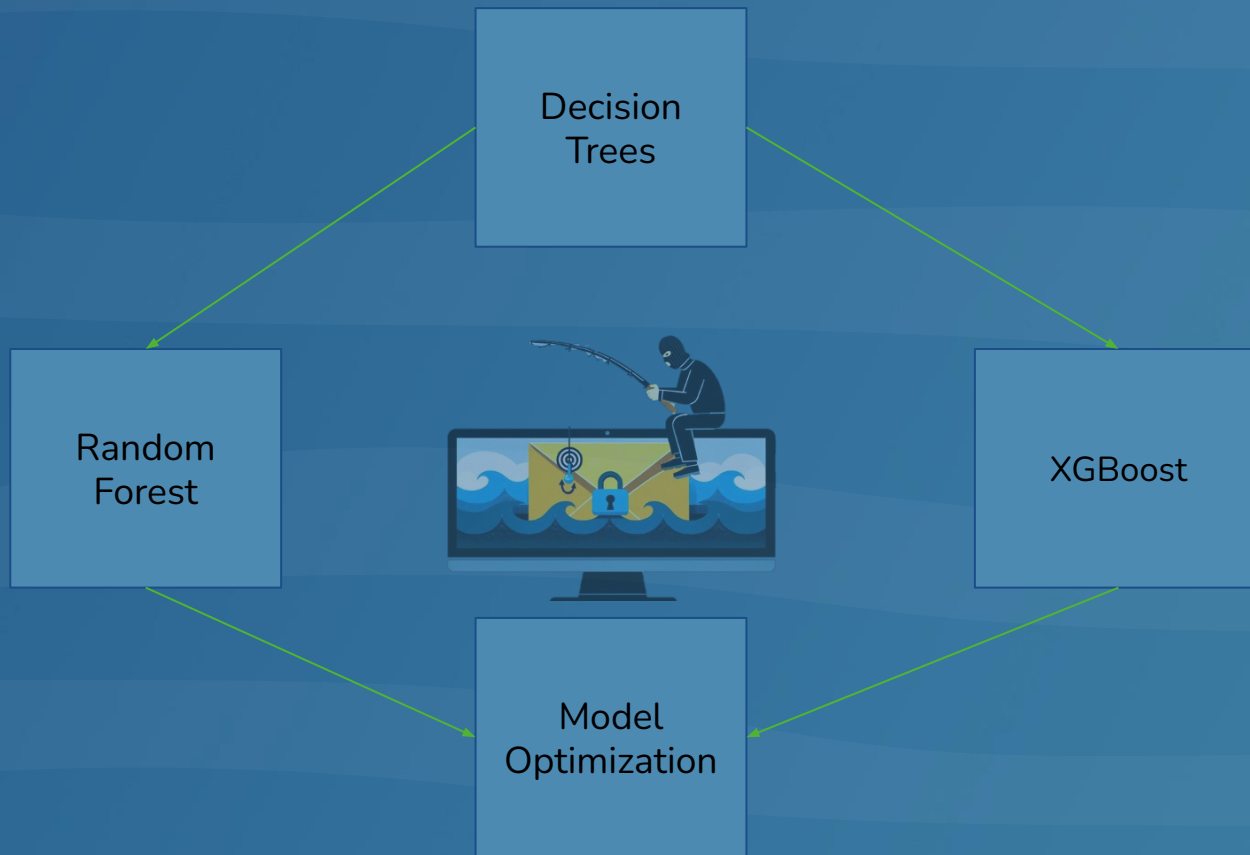
```
Accuracy: 0.9980491528658368
Precision: 0.9982205086379476
Recall: 0.9983685576566556
F1 Score: 0.9982945276583123
```

```
Confusion Matrix:
[[20141   48]
 [   44 26926]]
```

```
Classification Report:
```

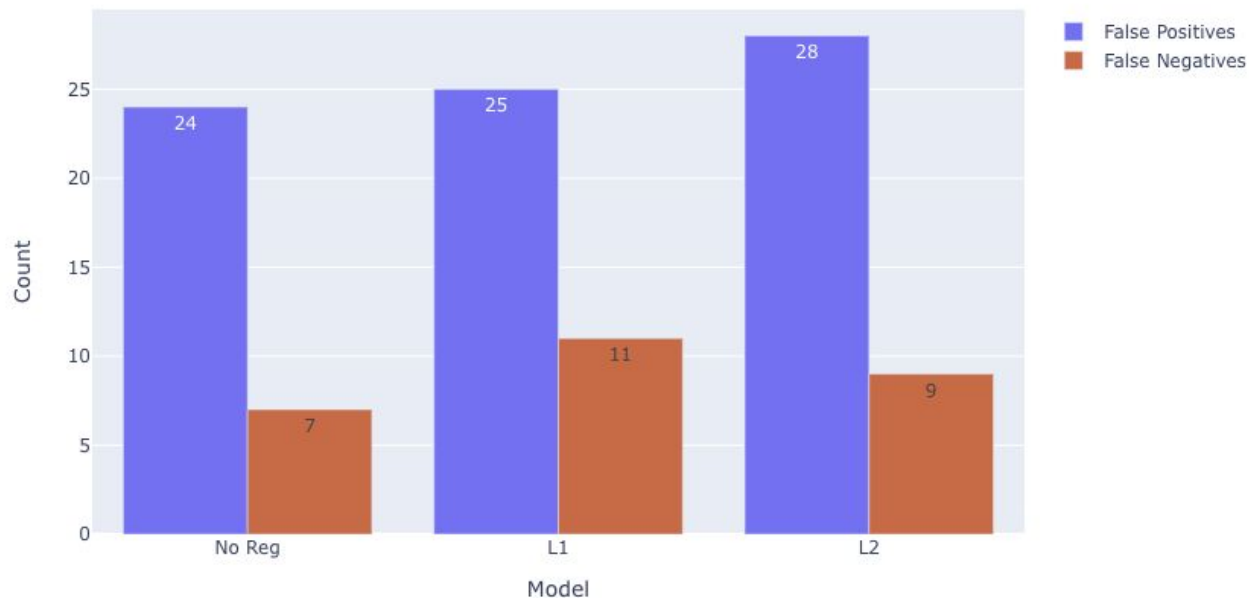
	precision	recall	f1-score	support
0	1.00	1.00	1.00	20189
1	1.00	1.00	1.00	26970
accuracy			1.00	47159
macro avg	1.00	1.00	1.00	47159
weighted avg	1.00	1.00	1.00	47159

# Advanced Modelling



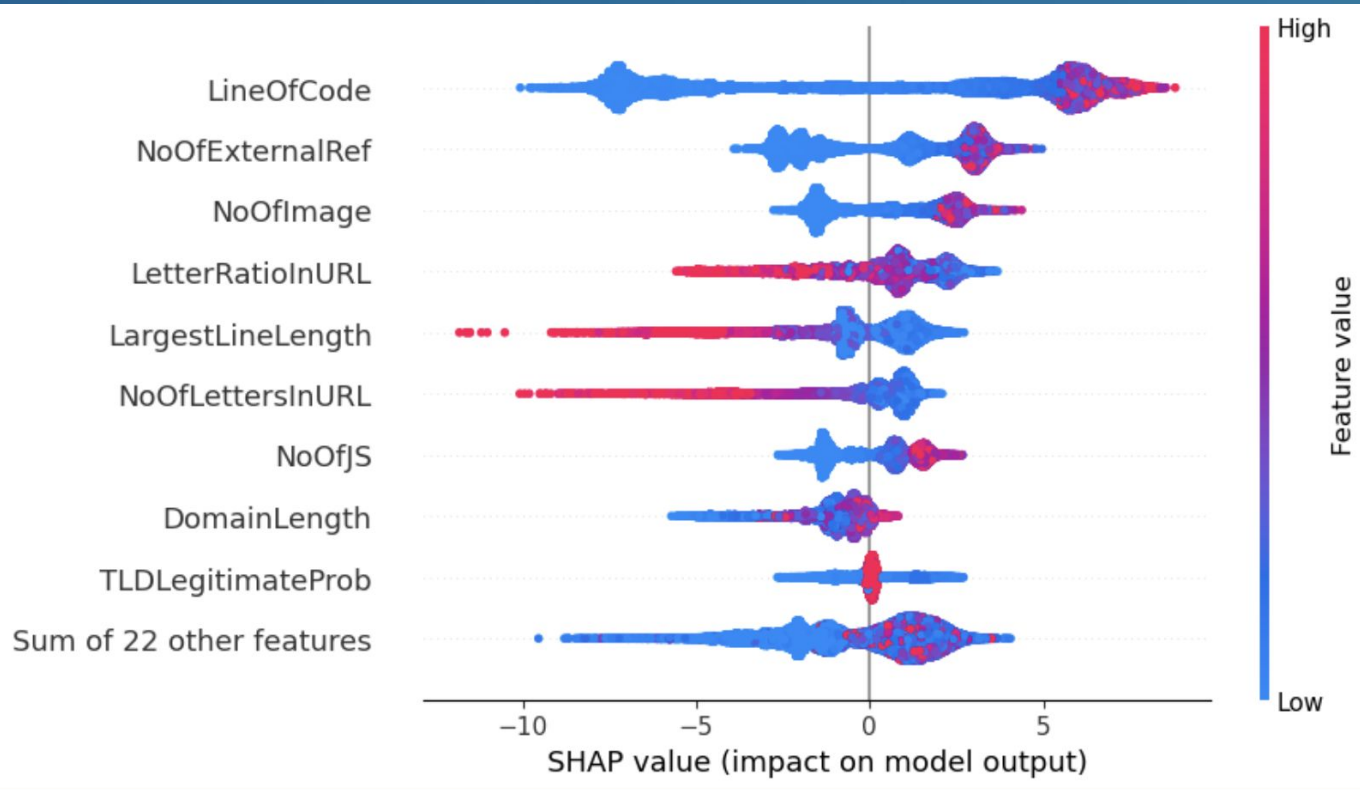
# The Best XGBoost Model

False Positives and False Negatives by Model



# Advanced Modeling Result

## SHAP Plot



# References

- [1]<https://smallbiztrends.com/small-business-cybersecurity/>
- [2]<https://www.ibc.ca/news-insights/news/small-businesses-are-underestimating-their-cyber-risk-despite-increased-threats>
- [3]<https://www.forbes.com/sites/edwardsegal/2022/03/30/cyber-criminals/>

# Product Demo

## CatchPhish - Phishing URL Detector

Enter the URL to check

# Thank You

