Heuristic Based Approach for Phishing Site Detection

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Index

Abstract

- Phishing has been a major security threat in which there is a huge loss for companies as well as customers.

- These phishing attacks are increasing day by day due to lack of efficient detection techniques and effective preventive measures.

Contd…

- This paper proposes a Heuristic-based phishing detection algorithm. In particular, this research focuses on improving upon the previously published text-based approach.

- The algorithm in the previous work analyzes the body text in an email to detect whether the email message asks the user to do some action such as clicking on the link that directs the user to a fraudulent website

Introduction

- Phishing is a type of social engineering attack that targets a user‘s sensitive information through a phony website that appears similar to a legitimate site, or by sending a phishing email [1].

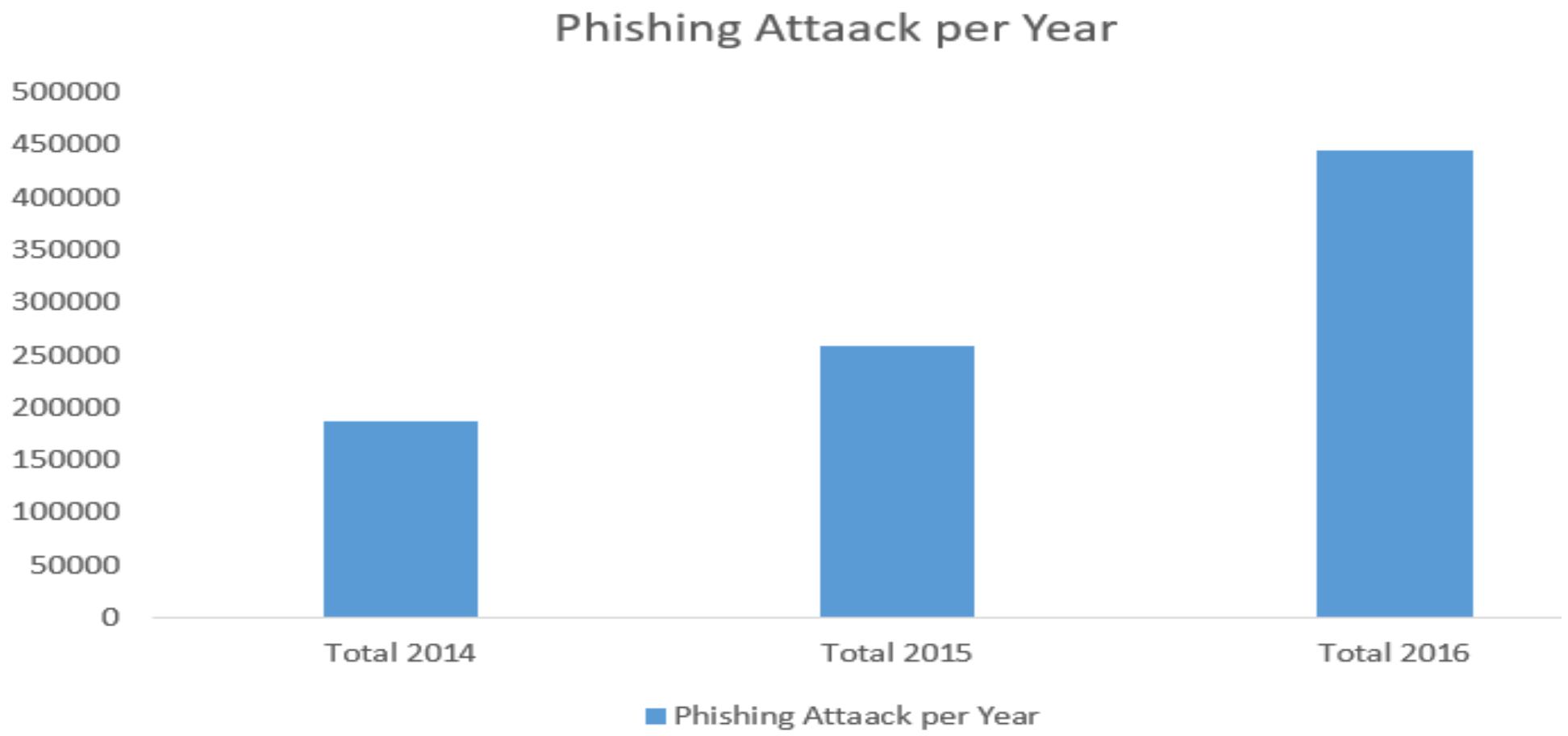
- Phishing is a malicious use of Internet resources carried out to trick Internet users to reveal personal information, such as usernames, credit card information, and Social Security numbers to the attacker[2].

- Various approaches have been proposed and implemented to detect a variety of phishing attacks such as use of blacklists and whitelists

Contd…

- We propose a desktop application called PhishSaver, which focuses on URL and website content of the phishing web page.
- We aim at detecting phishing websites using Decision tree - Machine learning techniquewith the help of a desktop application named PhishSaver.
- Phish-Saver use a heuristic features to detect a number of phishing attacks

Phishing Attack Survey



Literature Review

Title	Problem Identified	Methodology	Strength	weakness
The Sceured Anti-Phishing Approach Using image based Validation. Y. Yesu Jyothi, D.Srinivas & k.GovindaRaju,2013	To solve the problem of phishing & protect individual personal private information	Visual Cryptography (image based validation)	It prevents attack of phishing websites on financial portal,banking portal & online shopping market	Inability to recover missing or corrupt share
Protecting users Against phishing attacks. Engin kirda & Chistopher Kruegel,2012	Increased email linked to phishing scams	Browser Extension	It protect users against spoofed website – based phishing attacks	It requires that user support to capture & store sensitive information rather than automatically captureing & storing the sensitive information
Phishnet Anti-Phishing Technique(Prakash et al.,2010)	Predicts varation of URLs	Heuristics	It replace Top level domain(TLD),Dirctory structure similarity,IP address equivalence,Qury string substitution & brand name equivalence	It connot detect zero day phishing

Problem Statement

- Phishing has been a major security threat in which there is a huge loss for companies as well as customers. These phishing attacks are increasing day by day due to lack of efficient detection techniques and effective preventive measures.

- A comprehensive efficient detection technique should be developed in order to detect and inform the web users about the phishing attacks to make sure that their sensitive data will not be disclosed during these attacks.

- This research project deals with a comprehensive heuristic based method for phishing detection which is based on content of the website through which phishing attacks can be discovered

Project Scope

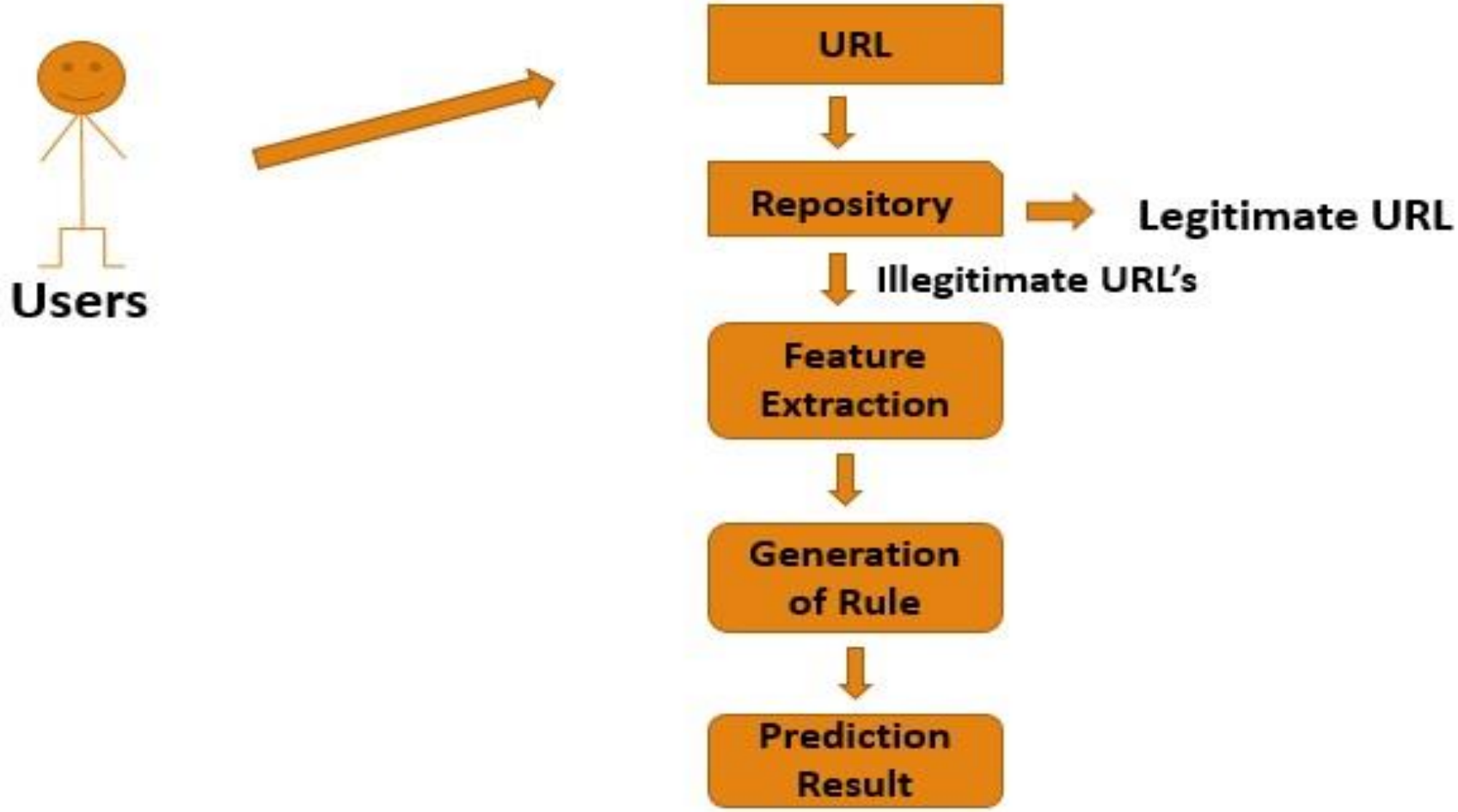
- In this project URL- based heuristic approach will be used along with the ranking of sites to extract the features from the URL.
- All the extracted features along with the phishing and legitimate sites URLs will be stored in database.
- A classifier will be generated using decision tree algorithm which will classify the URLs as phishing and legitimate.

Contd…

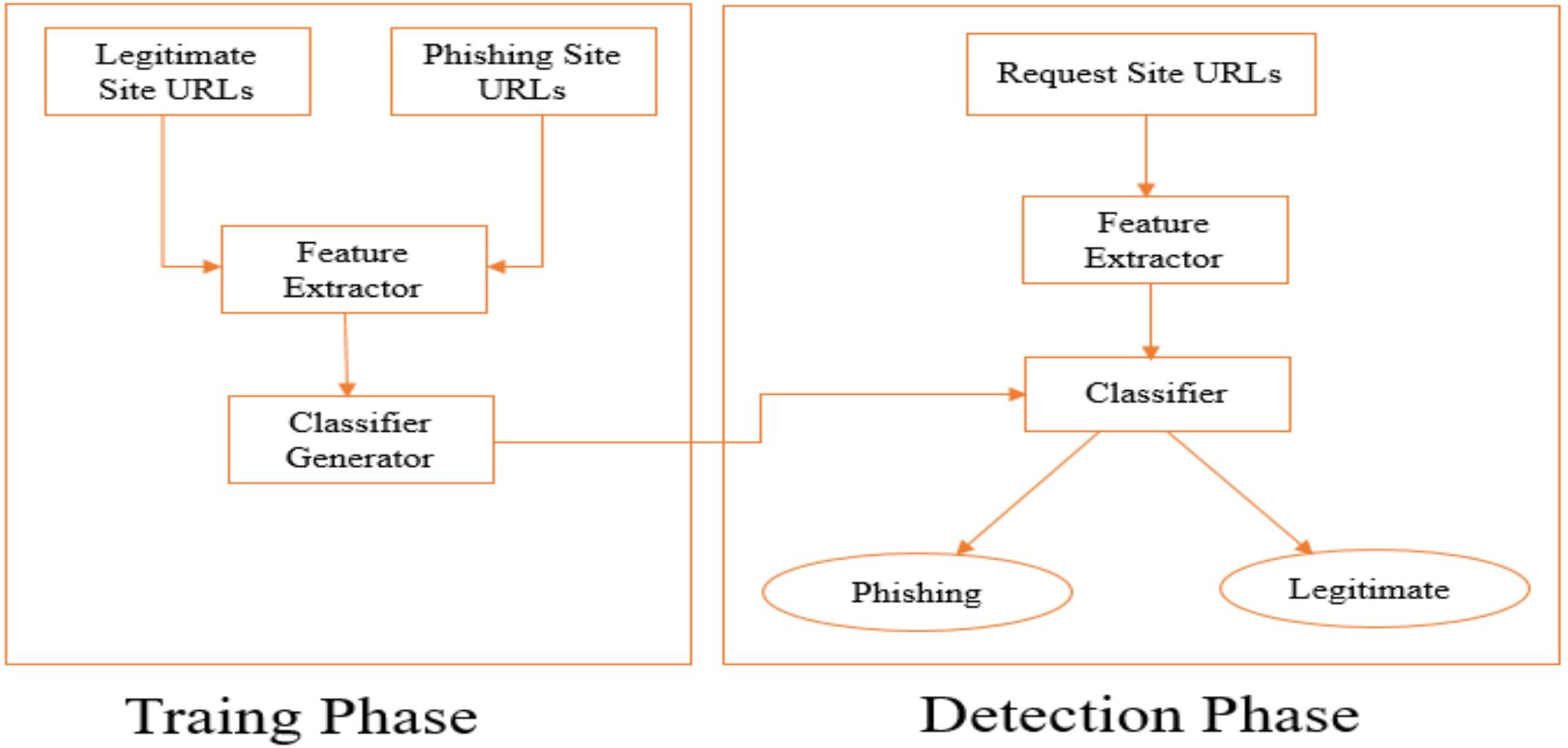
- When new URL is received it will extract the features and will compare them with the features stored in database, thus classifying the incoming site as phishing or legitimate.

- This rule induction helps to facilitate the decision making process which ensures reliability and completeness

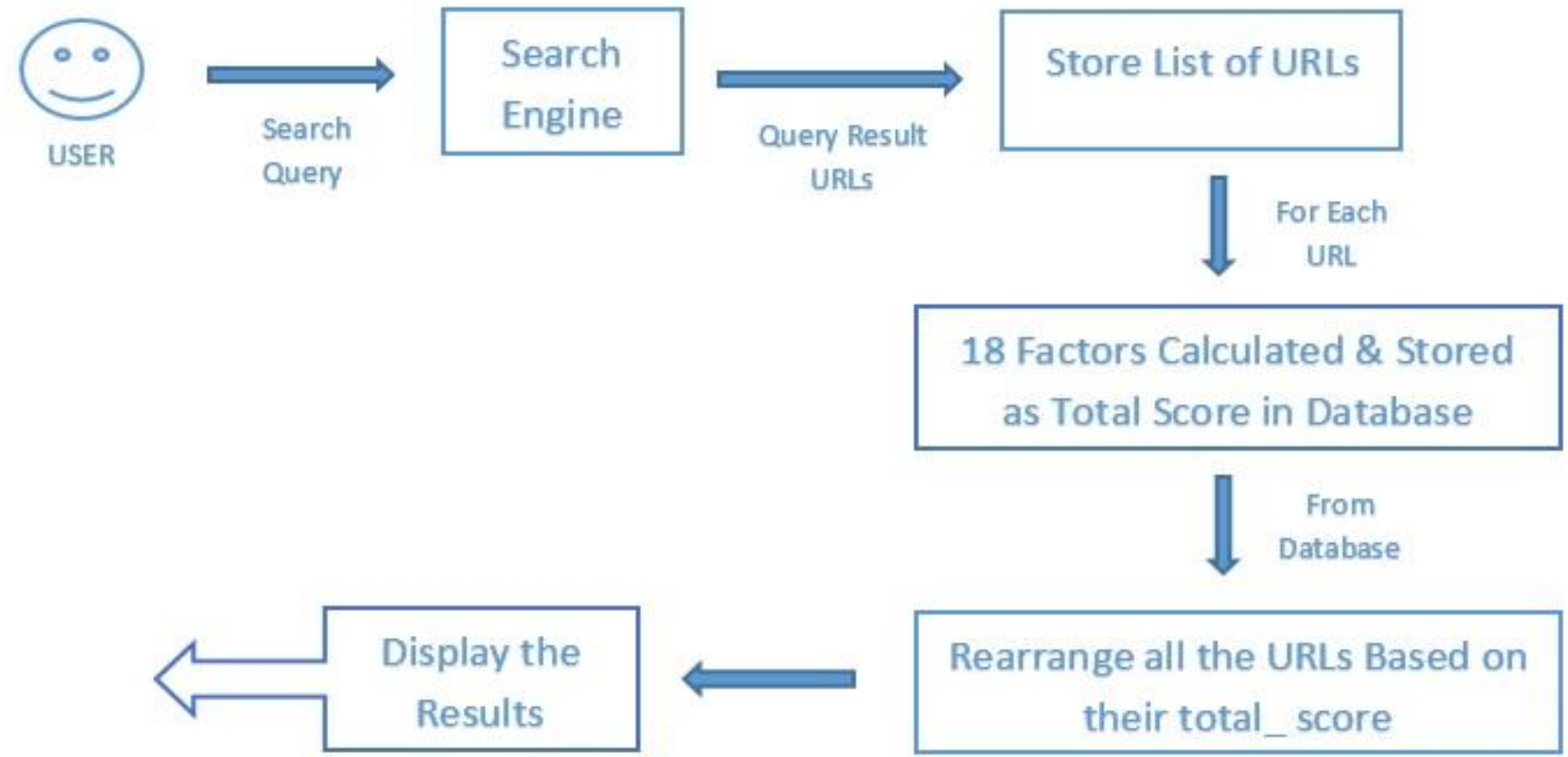
Use case Diagram



Architecture



Block Diagram



Project Future Plan

- In future work, we intend to address the time-intensive disadvantage of the heuristic-based technique. With a large number of features, it is time-consuming for the heuristic-based approach to generate classifiers and perform classification . Therefore, we will apply algorithms to reduce the number of features and thereby improve performance.

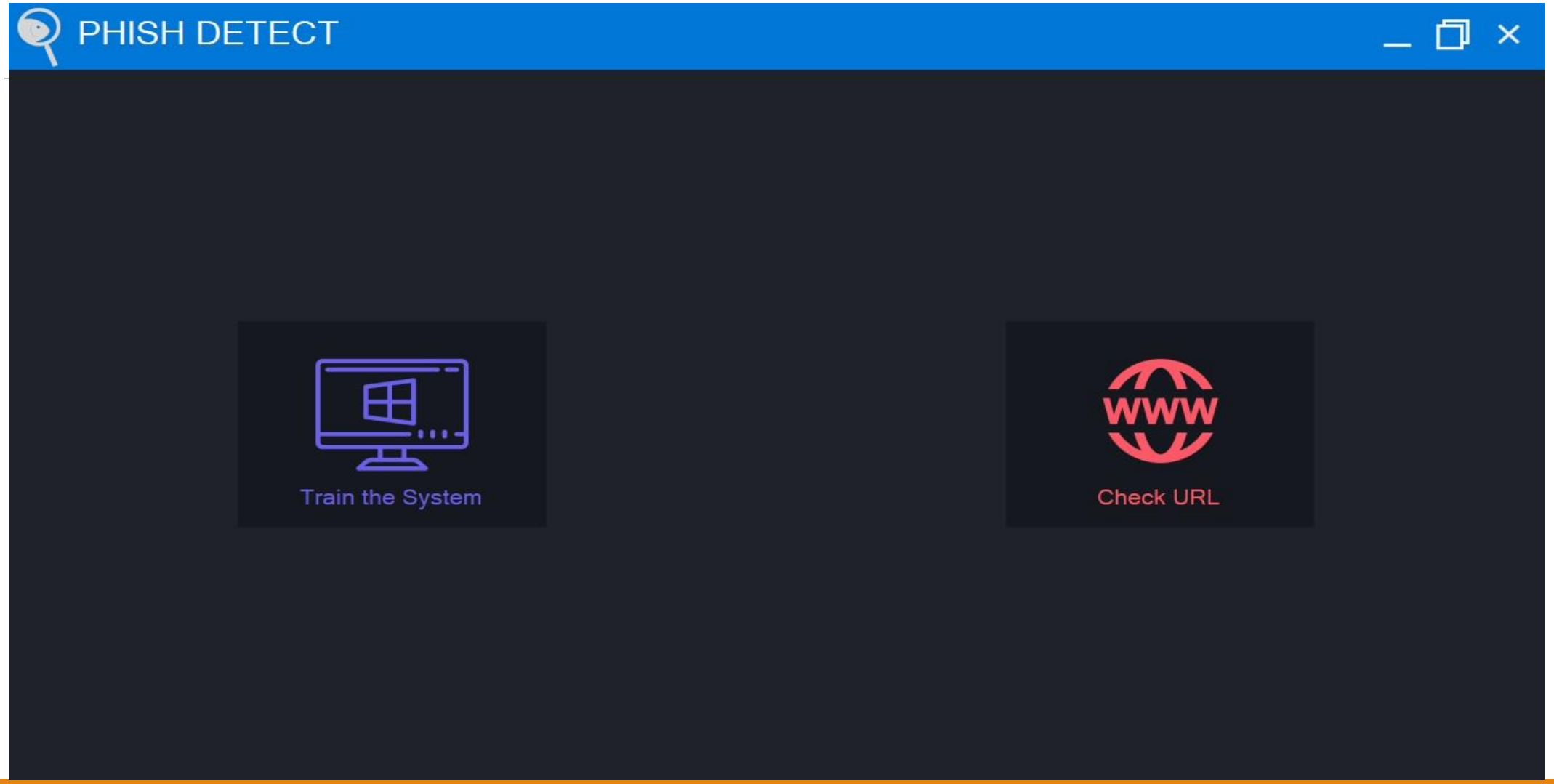
- In addition, we will examine a new phishing detection technique that uses not only URL-based features, but also HTML and JavaScript features of web pages to improve performance.

- Also make plugin for the browser which will alert user about phishing website and reduce damage cause with it as much as possible.

Summary

- The proposed model can reduce damage caused by phishing attacks because it can detect new and temporary phishing sites.
- System also implemented decision tree algorithm and generated tree for it We will be looking forward for the new features to use and try to improve more accuracy and reduce false positive value of the system.
- We also look forward to discover new feature with high impact to detect phishing.

Prototype



PHISH DETECT

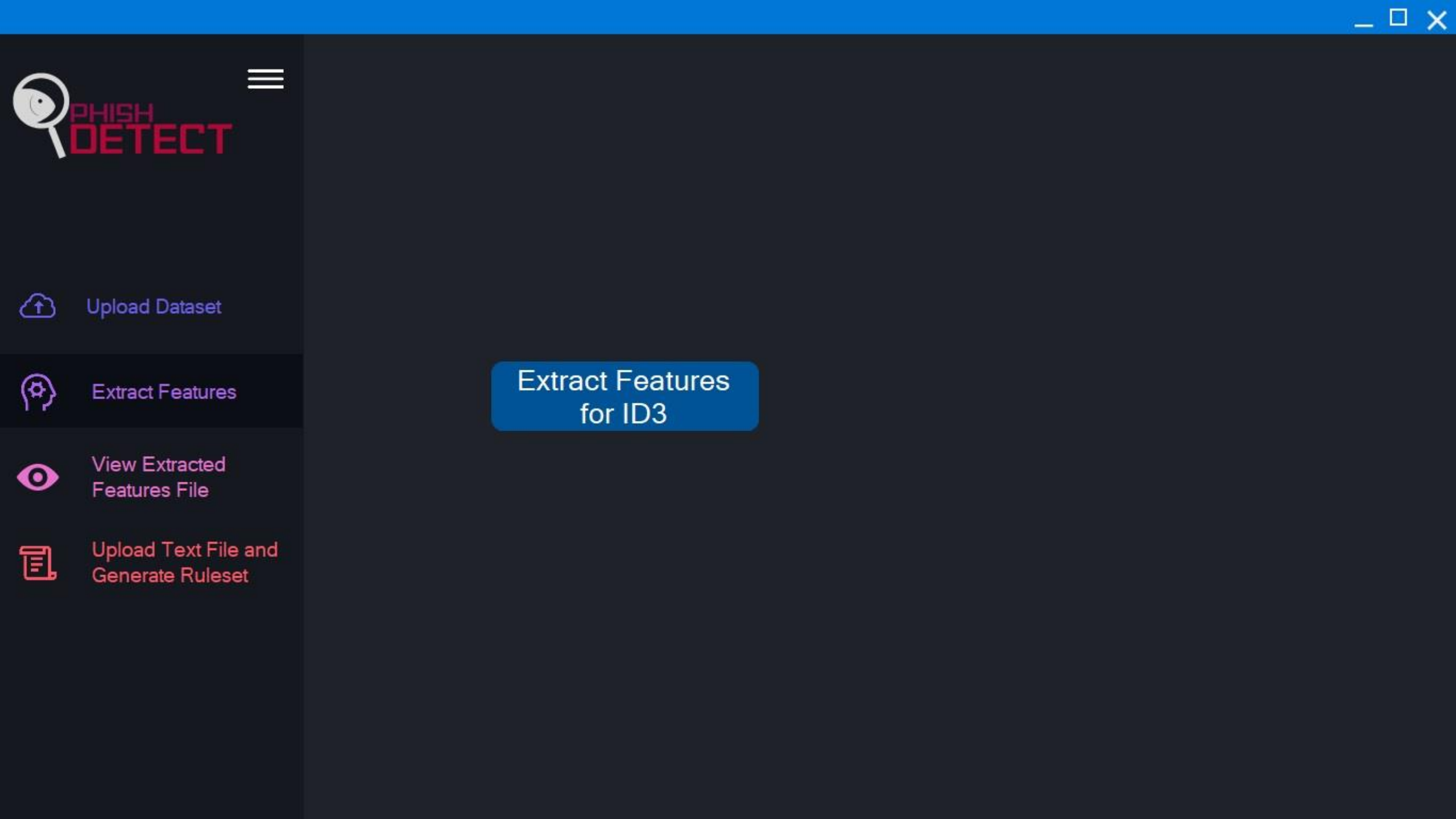
- Upload Dataset
- Extract Features
- View Extracted Features File
- Upload Text File and Generate Ruleset

Drag & Drop files

E:\PhishDetect-6.1-20180428T054754Z-001\testing_dataset

Browse

Upload


PHISH
DETECT
Upload Dataset
Extract Features
View Extracted Features File
Upload Text File and Generate Ruleset
Extract Features for ID3

PHISH DETECT

Upload Dataset

Extract Features

View Extracted Features File

Upload Text File and Generate Ruleset

View

	ip_contains	length_of_URL	suspicious_char	prefix_suffix	dots	sub_domain	slash	http_has
	0	0	0	0	1	0	1	1
	0	1	0	1	1	0	1	1
	0	1	0	0	1	0	1	1
	0	1	0	0	1	1	1	1
	0	1	0	0	1	0	1	1
	0	0	0	1	0	0	0	1
	0	1	0	0	1	1	1	1
	0	1	0	0	1	1	1	1
	0	1	0	1	1	0	1	1
▶	0	1	0	0	1	0	1	1
	0	1	0	0	1	1	1	1
	0	0	0	0	0	0	0	1
	0	1	1	0	1	0	1	1
	0	1	0	0	1	0	1	1
	0	1	0	0	1	0	1	1
	0	1	0	0	1	0	1	1
	0	0	0	1	1	0	1	1
	0	0	0	1	1	0	1	1
	0	0	0	1	1	0	1	1
	0	0	0	1	1	0	1	1
	0	0	0	0	1	0	1	1
	0	0	0	1	1	0	1	1

PHISH DETECT

Upload Dataset

Extract Features

View Extracted Features File

Upload Text File and Generate Ruleset

View

	ip_contains	length_of_URL	suspicious_char	prefix_suffix	dots	sub_domain	slash	http_has
	0	0	0	0	1	0	1	1
	0	1	0	1	1	0	1	1
	0	1	0	0	1	0	1	1
	0	1	0	0	1	1	1	1
	0	1	0	0	1	0	1	1
	0	0	0	1	0	0	0	1
	0	1	0	0	1	1	1	1
	0	1	0	0	1	1	1	1
	0	1	0	1	1	0	1	1
▶	0	1	0	0	1	0	1	1
	0	1	0	0	1	1	1	1
	0	0	0	0	0	0	0	1
	0	1	1	0	1	0	1	1
	0	1	0	0	1	0	1	1
	0	1	0	0	1	0	1	1
	0	1	0	0	1	0	1	1
	0	0	0	1	1	0	1	1
	0	0	0	1	1	0	1	1
	0	0	0	1	1	0	1	1
	0	0	0	1	1	0	1	1
	0	0	0	0	1	0	1	1
	0	0	0	1	1	0	1	1

PHISH DETECT

Upload Dataset

Extract Features

View Extracted Features File

Upload Text File and Generate Ruleset

```
if(sd== "0")
{

if(ph== "0")
{


if(sc== "0")
{



if(d0== "1")
{



if(ps== "1")
{




if(ln== "1")
{
        return r="0";



}
else
{
```

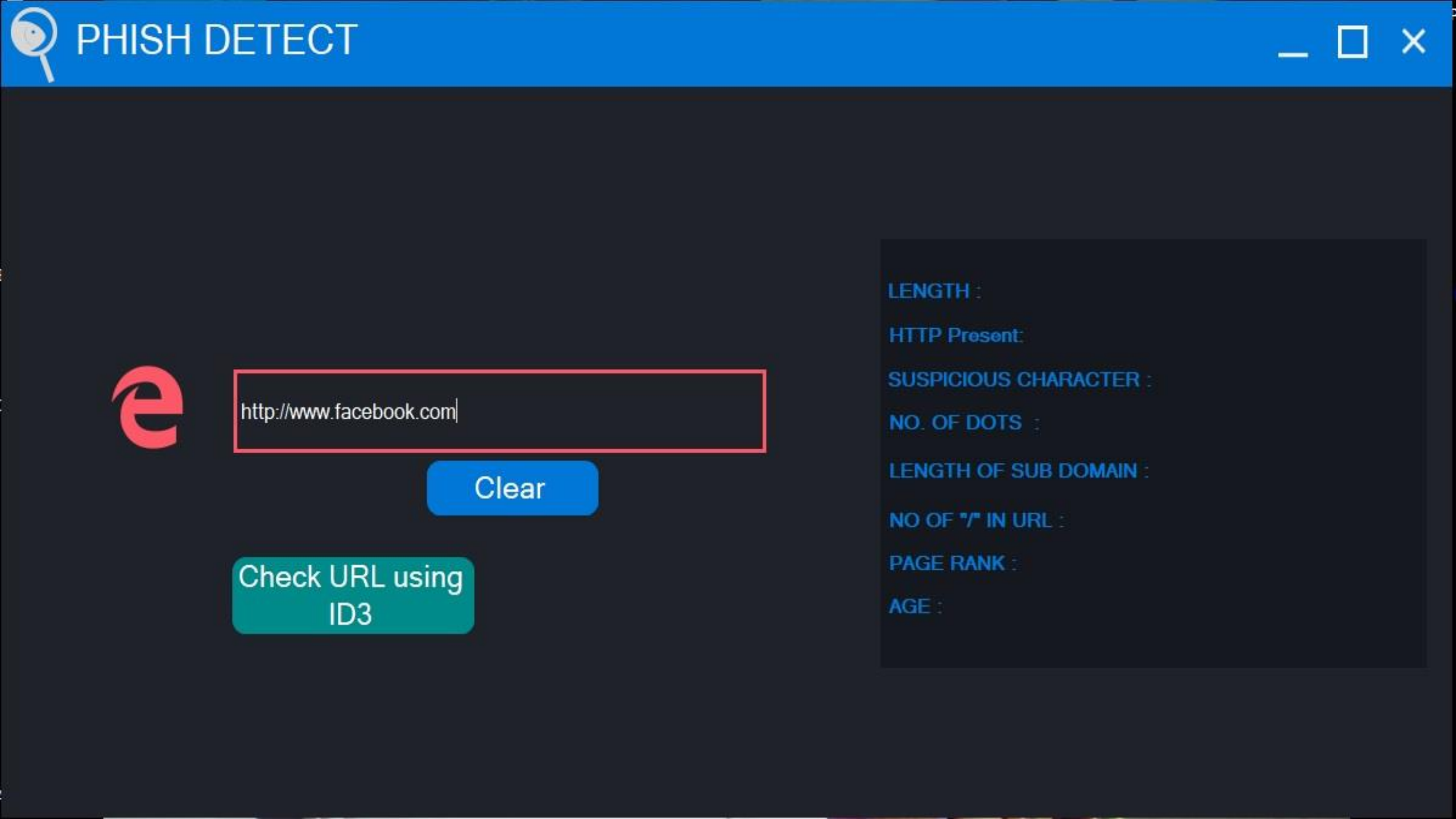
ID3

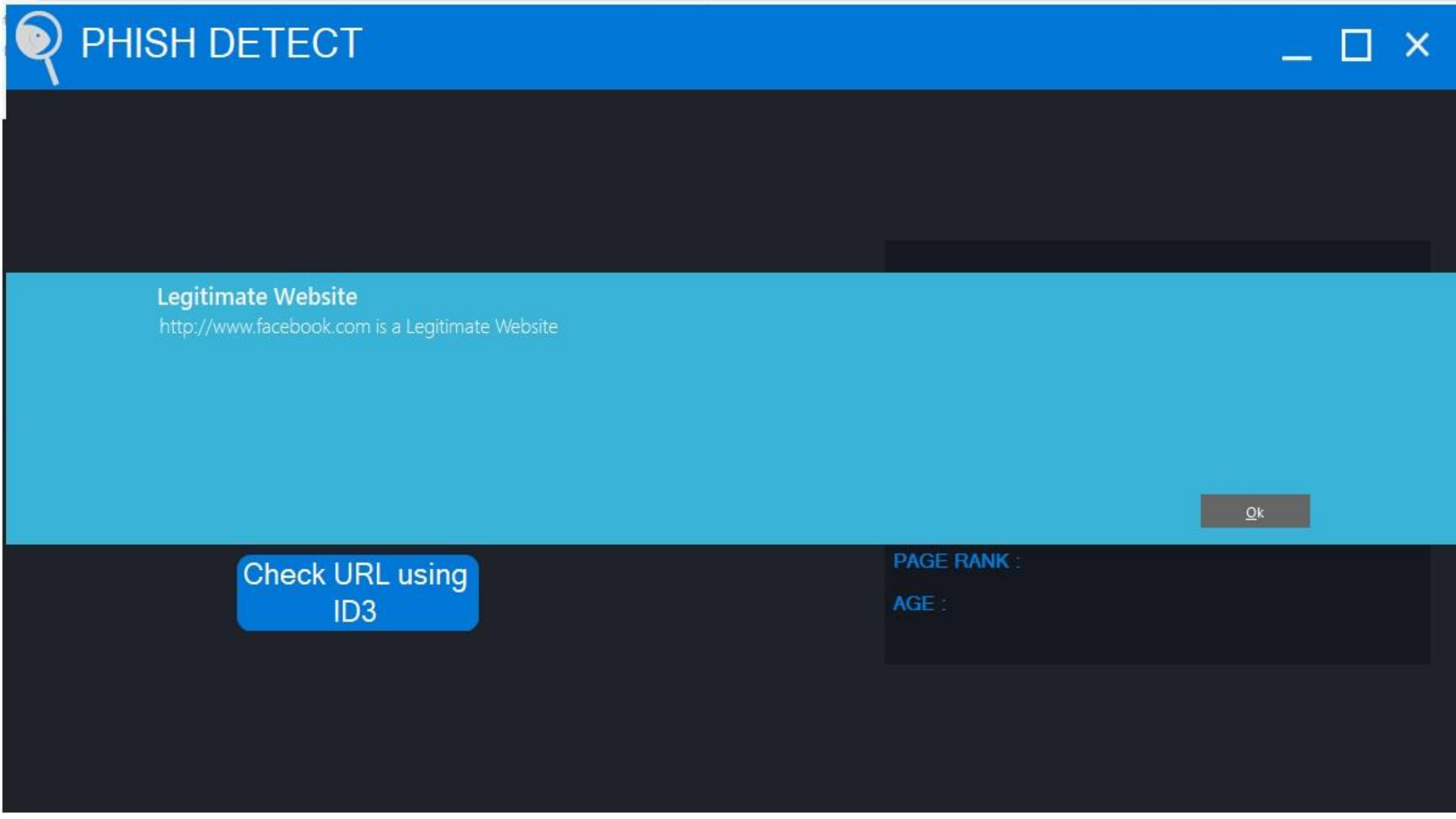
PHISH DETECT

Train the System

Check URL

PHISH DETECT


PHISH DETECT
http://www.facebook.com
Clear
Check URL using ID3
LENGTH :
HTTP Present:
SUSPICIOUS CHARACTER :
NO. OF DOTS :
LENGTH OF SUB DOMAIN :
NO OF "/" IN URL :
PAGE RANK :
AGE :


PHISH DETECT
Legitimate Website
http://www.facebook.com is a Legitimate Website
Ok
Check URL using ID3
PAGE RANK :
AGE :

Facebook – log in or sig

https://www.facebook.com/

facebook

Email or Phone

Password

Log In

Forgotten account?

Recent logins

Click your picture or add an account.

Chirag

Add Account

Create a new account

It's free and always will be.

First name

Surname

Mobile number or email address

New password

Birthday

30 Mar 1994

Why do I need to provide my date of birth?

Female Male

By clicking Sign Up, you agree to our Terms, Data Policy and Cookie Policy. You may receive SMS notifications from us and can opt out at any time.

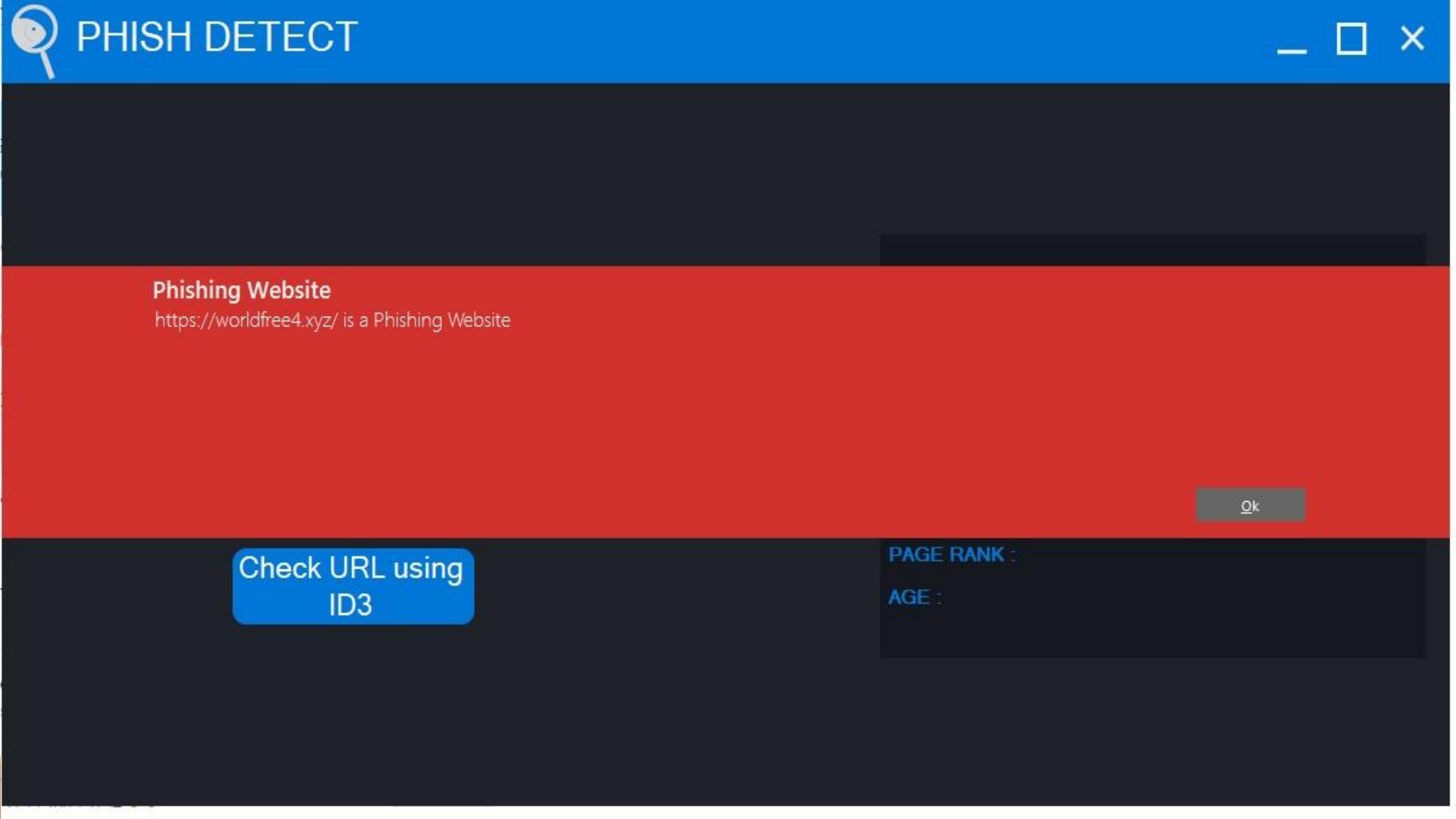
Sign Up

Create a Page for a celebrity, band or business.

https://www.facebook.com/login/

Type here to search

ENG 19:22 30-03-2019


PHISH DETECT
Phishing Website
https://worldfree4.xyz/ is a Phishing Website
Ok
Check URL using ID3
PAGE RANK :
AGE :

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Thank You!