# Phishing Detection in Browsers using Machine Learning

Tanmay Naik

Khoury College of Computer Sciences

Northeastern University

Boston, US

naik.t@northeastern.edu

Nithin Gangadharan

Khoury College of Computer Sciences

Northeastern University

Boston, US

gangadharan.n@northeastern.edu

Abstract—Phishing is a cybercrime in which a target visits a website that is posing as a legitimate application, to lure individuals into providing sensitive data such as - banking and credit card details, and passwords. An unsuspecting user can click a link in an email or social media platform, and be led to a phishing website, leading to frauds and identity thefts. Phishing is a widespread attack that still does not have a concrete solution.

This report proposes a solution for the protection of end users through a browser extension while comparing various Machine Learning approaches to identify phishing websites. // TODO add "the most important results and findings"

## I. INTRODUCTION

With the recent advancement in various cybersecurity technology, the weakest link in the cybersecurity happen to be the end users. Attackers utilize phishing which exploits naivety of users to trick them into handing out sensitive information. This poses a great risk not only to the users themselves but the organizations and institutions of which they are a part of. According to recent research from Proofpoint, 75% of organizations around the world experienced a phishing attack in 2020, and 74% of attacks targeting US businesses were successful [1].

Apart from increasing security awareness among users, we must develop tools which complement that awareness to help them make safe decisions. This report proposes and demonstrates a Chromium-based browser extension to help mitigate the risk of phishing while browsing the web. The central idea of the browser extension is to notify the user whenever they open any *potential* phishing website.

The solution also includes a Python web server which utilizes various Machine Learning classification techniques to determine the legitimacy of the webpage in question. The web server takes in a URL and returns a boolean value indicating if the given URL is part of a potential phishing attempt.

The browser extension monitors each URL that the user visits, and tries to determine if the URL is malicious with the help of the web server. The web server exposes a REST API which is consumed by the extension for communication. The same API can also be reused as-is to implement a similar phishing detection in a different context like a network-level application or in a mobile application like Android.

//TODO "summary of experimental results which is more fine-grained than abstract."

## II. EASE OF USE

# A. Maintaining the Integrity of the Specifications

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- Use a zero before decimal points: "0.25", not ".25". Use "cm<sup>3</sup>", not "cc".)

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Number equations consecutively. To make your equations more compact, you may use the solidus ( / ), the exp function, or appropriate exponents. Italicize Roman symbols for quantities and variables, but not Greek symbols. Use a long dash rather than a hyphen for a minus sign. Punctuate equations with commas or periods when they are part of a sentence, as in:

$$a + b = \gamma \tag{1}$$

Be sure that the symbols in your equation have been defined before or immediately following the equation. Use "(1)", not "Eq. (1)" or "equation (1)", except at the beginning of a sentence: "Equation (1) is . . ."

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  word alternatively is preferred to the word "alternately"
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## TABLE I TABLE TYPE STYLES

Table	ble Table Column Head		
Head	Table column subhead	Subhead	Subhead
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<sup>a</sup>Sample of a Table footnote.

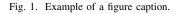


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## ACKNOWLEDGMENT

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#### REFERENCES

 Proofpoint, "Threat report: 2021 state of the phish report." [Online]. Available: https://www.proofpoint.com/us/resources/threat-reports/ state-of-phish

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