

Cyberattack Analysis and Prevention Methods

Rajya Chivaluri
Wentworth Institute of Technology
School of Computing and Data Science

Abstract—This report is designed to outline the process of a project focused on cybersecurity and the protection of data from a cyberattack. The project uses data analysis and modeling concept to analyze various vulnerabilities and fix them before they are used as a way to attack. The project also then uses machine learning to analyze possible attack opportunities that present themselves to a piece of technology and configures whether the opportunity is an actual attack or not.

Keywords—Cybersecurity, cyberattack, phishing, ransomware, DDoS, classification

I. INTRODUCTION (HEADING I)

Over the years, technology has become more accessible, but along with that, so has our data and privacy. There is a strong positive relationship between the increase in technology use and cyberattacks, including phishing attacks, ransomware attacks, DDoS attacks and unfortunately more. It impacts not only the individual users but also larger companies that use technology/the internet to complete their work. Thankfully, there are ways to solve these issues and experts work around the clock to strengthen all technology to fight off these attacks. This project will analyze the frequency of various types of cyberattacks, vulnerabilities to these attacks, and then look into possible solution for the most common/frequent attack. One solution, in particular, will use machine learning to separate data that comes in from a threat or just a malfeasance.

II. DATASETS

A. Source of dataset

This dataset is derived from Statista, a trusted platform that contains data and statistics about all sorts of topics. The dataset, titled “Annual Number of Cyberattacks Worldwide from 2016 to 2023, by Type (in millions)”, was generated and released in June of 2024 by the company themselves.

B. Character of the datasets

The dataset is visualized using a bar graph and contains “1.66 million incidents, followed by 1.5 million non-payment/non-delivery cases” (Petrosyan 2024). It contains 8 different types of cyberattacks: credit card fraud, investment fraud, phishing scams, extortion, non-payment/non-delivery, tech support, identity theft, and personal data breaches. No extra data cleaning was needed for this dataset as it was provided by a source that completes it ahead of time so that analysis can be done quicker and smoother, with no biases present.

III. METHODOLOGY

A. Exploratory Data Analysis

Exploratory data analysis (or EDA) will be used to analyze the frequency of various cyberattacks. The hope is that after completing this analysis, it will be known which attacks are the most frequent, making them a higher priority to handle. EDA will also be used to look at the success rates of previous

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tools and measures that have been taken to either a) prevent cyberattacks or b) handle them once they have already occurred. This will help figure out where the gaps in safety are.

B. Correlation Analysis

The statistical method of correlation analysis will be used to understand the most frequent causes of cyberattack causes and technological vulnerabilities that make one prone to a cyberattack. Once this analysis is completed, it should be seen which vulnerabilities need to be handled first and foremost.

C. Classification

The machine learning method of classification, when implemented, will use algorithms designed to separate any flag that comes in to a system between a possible cyberattack or just a fluke. To do so, SciKit will be used to develop and carry out said algorithms.

IV. RESULTS

In this section, present your findings using an appropriate method, such as equations, numerical summaries, or visualizations like charts and graphs. Clearly explain all results and provide guidance on how to interpret them. If any unexpected results arise, discuss possible reasons or contributing factors. To improve clarity and organization, consider using subsections (e.g., A, B) to separate different aspects of your results.

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A. Result A

Example: XXX

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B. Results B

Example: Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

C. Results C

a) *Positioning Figures and Tables:* Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation “Fig. 1”, even at the beginning of a sentence.

TABLE I. TABLE TYPE STYLES

Table Head	Table Column Head		
	Table column subhead	Subhead	Subhead
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^a Sample of a Table footnote. (*Table footnote*)

Fig. 1. Example of a figure caption. (*figure caption*)

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V. DISCUSSION

Every method/project has its shortage or weakness. Please discuss the unsatisfied results in your project. And discuss the feasible suggestions of future work to revise/improve your result.

Example: xxx

VI. CONCLUSION

In this part, you should summarize your project. What important results did you find for your topic and what's the effect of this result on the real-world?

Example: xxx

ACKNOWLEDGMENT (*Heading 5*)

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REFERENCES

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