UNIVERSITY OF MALAYA

Leveraging Nonlinear Systems Equation for Efficient Spam Email Detection

Group A

December 30, 2024

Group Members

Matrix Number	Name
S2191553	Yerong Liu
U2100875	HAFIZ AIMAN BIN SHAMSUL BAHARI
S2148250	SOO WEE LIM
U2101770	MUHAMMAD AIDIL SHAZWAN BIN MARZUKHI
S2190329	Yulun Deng
S2109049	SUMAIYA MUNTAREEN BILLAH

Introduction

Email remains a cornerstone of communication in the digital age, but its widespread use has led to the proliferation of spam emails, ranging from simple advertisements to malicious phishing and malware attempts. Traditional detection methods often fall short in addressing the complexity and adaptability of modern spam strategies. To tackle this challenge, integrating nonlinear systems equations into the **Backpropagation** process of machine learning models offers a promising solution. Nonlinear systems excel at capturing intricate patterns within data, enabling neural networks to better differentiate legitimate emails from spam while adapting to evolving threats. This approach enhances both detection accuracy and computational efficiency, providing a robust framework for large-scale email filtering.

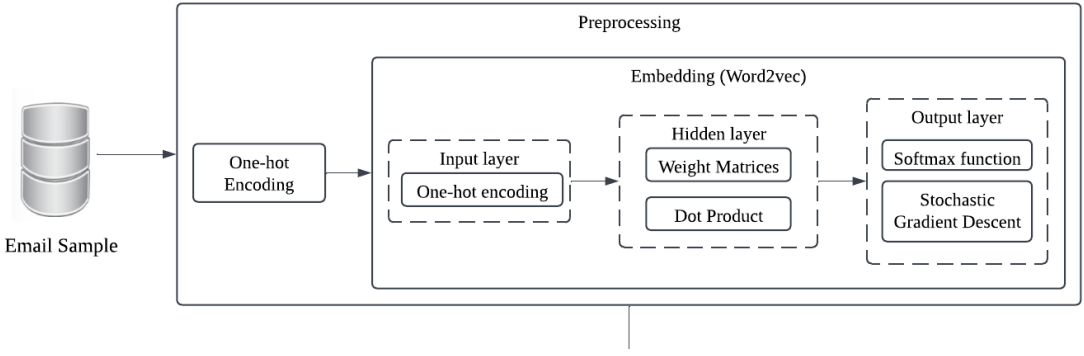
objectives

- **Reducing Data Noise:** By filtering out spam, we can ensure that important communications are not lost among irrelevant messages, improving the efficiency of email usage.
- **Enhance Spam Detection Efficiency:** Incorporate nonlinear system equations into the backpropagation process and loss function calculations of machine learning models to improve the model's ability to efficiently identify and filter spam emails, even as spam strategies evolve.
- **Improve User Experience and System Adaptability:** Optimize the model to maintain computational efficiency while adapting to changing spam patterns, ensuring a seamless, responsive email filtering system that enhances the overall user experience.

Problem statement and objectives

To detect the spam email to mitigate the security risks, reduce resource wastage, productivity loss and trust issues.

Basic Flow Chart (Example)



Basic Flow Chart (Example)

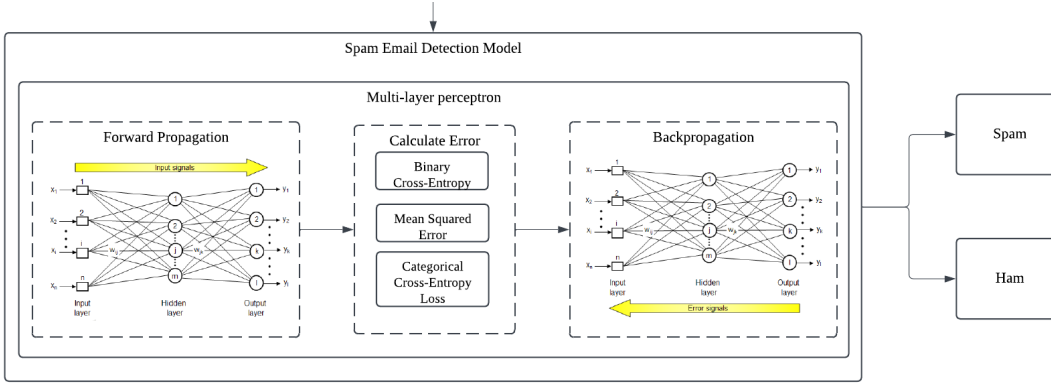


Figure: Detection Model

Methodology

Conclusion

Thank You