

## **ANALYZING THE PERFORMANCE OF ALPHABET BASED TEXT STEGANOGRAPHY PROTOTYPE**

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**ABSTRACT-** Text steganography was a sophisticated technique used for covert communication, where information was concealed within seemingly innocuous text. This study aimed to introduce an alphabet-based text steganography prototype and conducted a comprehensive analysis of its performance. The objectives were twofold: firstly, to develop an advanced text steganography method that effectively utilized alphabets to hide sensitive information within innocuous text, and secondly, to evaluate the performance of the developed text steganography prototype in a thorough manner, with a focus on NST, embedding capacity, and robustness. Rigorous experimentation and analysis were conducted using diverse datasets and benchmarking tools. A wide range of text samples were gathered from different sources and genres to ensure representativeness and generalizability. The performance metrics, including NST, embedding capacity, and robustness, were quantitatively assessed to gain a comprehensive understanding of the prototype's capabilities and limitations. The outcomes of this study significantly contributed to the advancement of text steganography techniques, providing valuable insights for the development of secure and efficient covert communication systems. Future research could explore the integration of machine learning algorithms and advanced linguistic analysis techniques to further enhance the security and performance of alphabet-based text steganography. Overall, this study presented an alphabet-based text steganography prototype and provided a comprehensive evaluation of its performance, making a noteworthy contribution to the field of text steganography and enabling more effective covert communication methods.

**Keywords:** Text steganography, performance evaluation, NST, embedding capacity, robustness

### **1. INTRODUCTION**

Text steganography played a critical role in ensuring information confidentiality in digital communication. The study addressed the challenges of limited text steganography options, linguistic complexity, and available empty space. The objective was to develop a prototype of alphabet-based text steganography that could securely hide information within text. The prototype employed embedding techniques to ensure the secrecy and integrity of the hidden data, utilizing alphabet characters as carriers. The performance of the prototype was evaluated through three analyses: NST, embedding capacity, and robustness.

### **2. METHODOLOGY**

The alphabet-based text steganography prototype was developed through the design and implementation of a text steganography system. Different encryption algorithms were explored to safeguard the hidden information from unauthorized access or detection. The prototype utilized embedding techniques to conceal information within the text while preserving its readability and naturalness. The evaluation was conducted, assessing the NST, embedding capacity, and robustness of the prototype using predefined metrics.

### **3. RESULTS AND DISCUSSION**

The performance of the developed text steganography prototype was evaluated by presenting and analyzing the evaluation findings. The NST was calculated to assess the effectiveness of the encryption technique and the system's vulnerability to different attacks. The embedding capacity, which determined the amount of hidden information that could be concealed without compromising readability, was estimated. Additionally, the prototype's resilience was evaluated by examining its resistance to various attacks and potential distortions.

### 3.1 TEXT ANALYSIS

The table and chart below show the text analysis for text input with and without space.

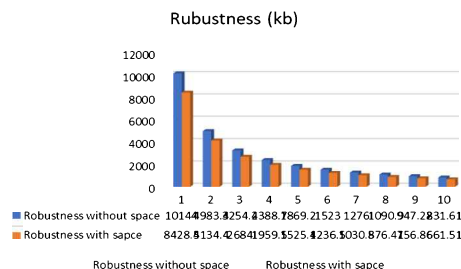


Figure 1: Comparison for Robustness

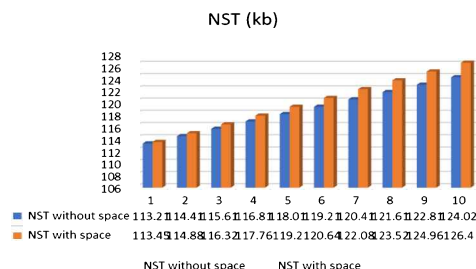


Figure 2: Comparison for Distribution of NST

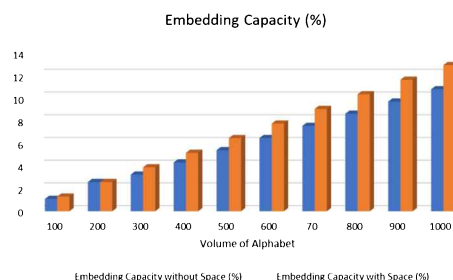


Figure 3: Comparison for Embedding Capacity

## 4. NOVELTY OF RESEARCH / PRODUCT

This project distinguished itself by focusing specifically on alphabet-based text steganography and utilizing .txt files as cover files. The performance analysis or metrics centered around three key aspects: NST, embedding capacity, and robustness.

## 5. CONCLUSION

In summary, the development and evaluation of the alphabet-based text steganography prototype provided valuable insights into its performance. The prototype demonstrated promising results in terms of NST, embedding capacity, and robustness. The findings from this research contributed to the progress of text steganography techniques, further improving secure communication in various domains.

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