CAPSTONE PROJECT

SECURE DATA HINDING IN IMAGES USING STEGANOGRAPHY

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OUTLINE

- Problem Statement
- Technology used
- Wow factor
- End users
- Result
- Conclusion
- Git-hub Link
- Future scope

PROBLEM STATEMENT

Data Security Concerns:

Increasing incidents of data breaches and unauthorized access.

Need for secure methods to transmit sensitive information.

Steganography as a Solution:

Hiding data within images to ensure confidentiality.

Protecting data from detection while maintaining usability.

TECHNOLOGY USED

Steganography Techniques:

Least Significant Bit (LSB) method for hiding text in images.

Image formats suitable for steganography (e.g., PNG, BMP).

Tools and Libraries:

Python Imaging Library (PIL) for image manipulation.
Programming languages: Python for implementation.
Used OpenCV (Open Source Computer Vision Library) in python

I used pip to packages in python Used to install the Pillow and OpenCV libraries

Example Code:

Brief overview of the code for hiding and extracting text from images

.

WOW FACTORS

Innovative Applications:

- Secure communication in military and government sectors.
- Digital watermarking for copyright protection.

Real-World Examples:

- Use in social media for private messaging.
- Applications in digital forensics for evidence protection.

Visual Demonstration:

- Before and after images showing hidden data.

END USERS

Target Audience:

Individuals needing secure communication (e.g., journalists, activists).

Businesses protecting sensitive information (e.g., financial data).

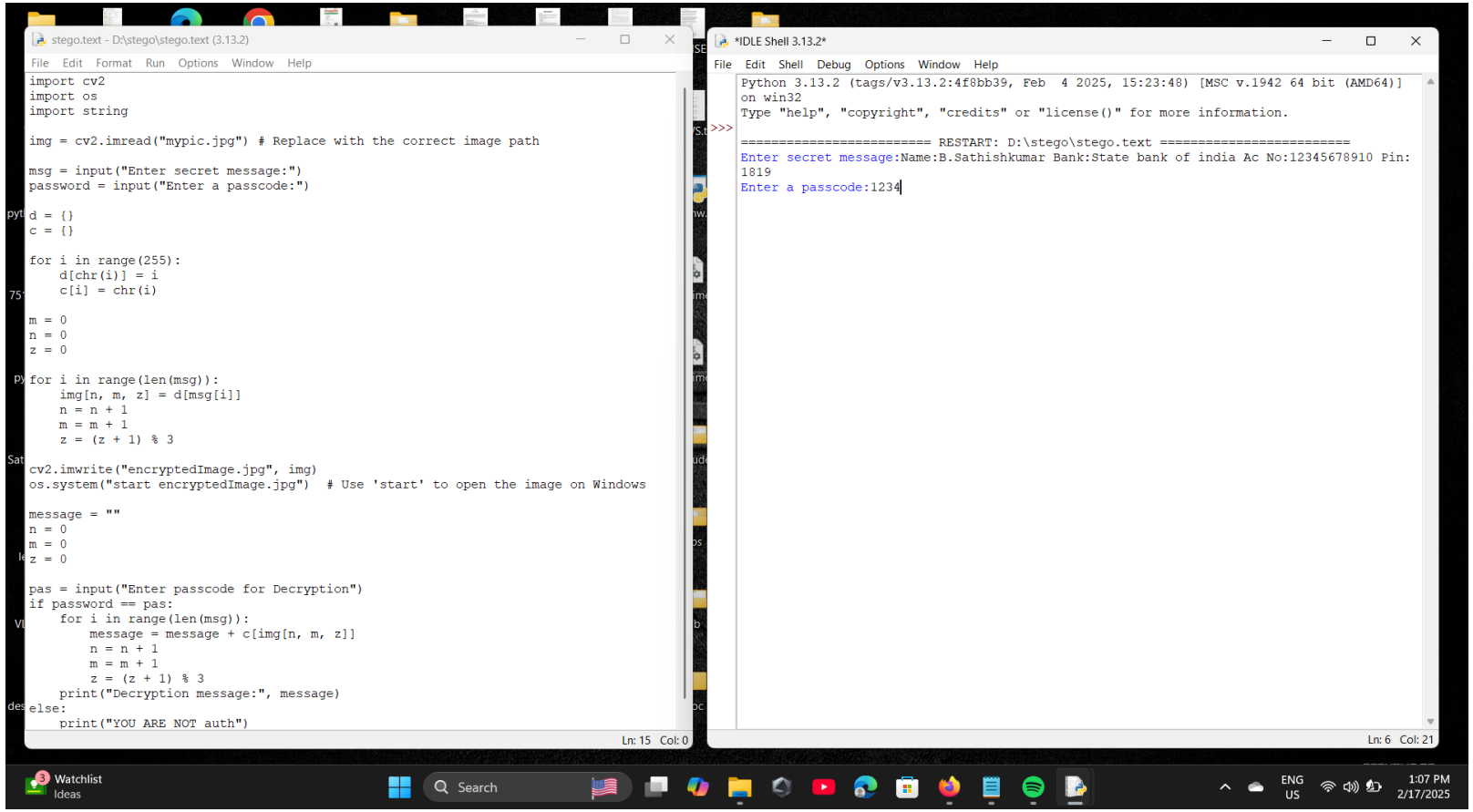
Developers and researchers in cybersecurity.

Benefits for Users:

Enhanced privacy and security.

Easy integration into existing systems.

RESULTS



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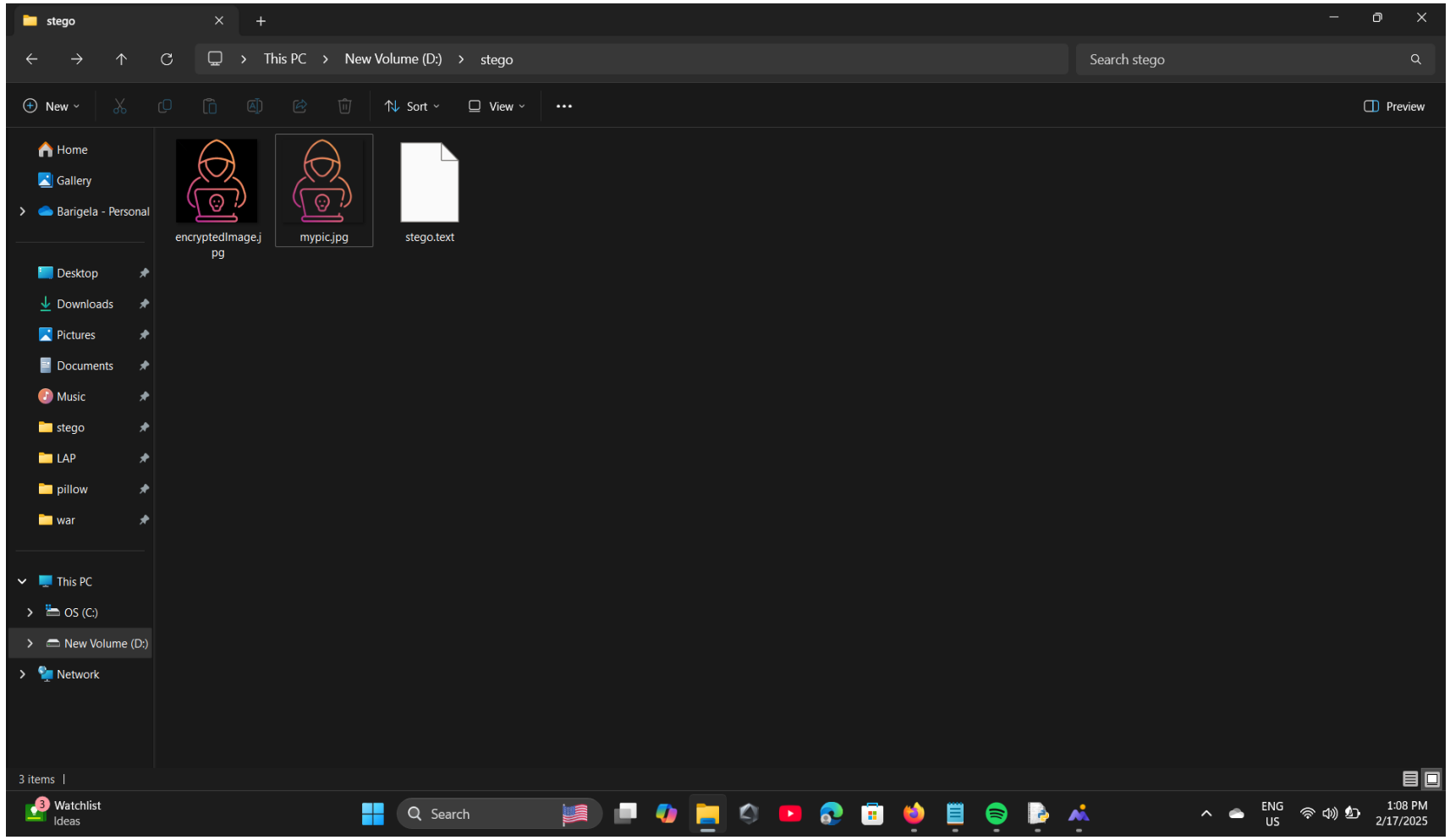
stego
This PC
New Volume (D:)
stego
Search stego
New
Sort
View
Preview
Home
Gallery
Barigela - Personal
Desktop
Downloads
Pictures
Documents
Music
stego
LAP
pillow
war
This PC
OS (C:)
New Volume (D:)
Network
encryptedImage.jpg
mypic.jpg
stego.text
3 items
Watchlist
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stego.text - D:\stego\stego.text (3.13.2)

File Edit Format Run Options Window Help

```python
import cv2
import os
import string

img = cv2.imread("mypic.jpg") # Replace with the correct image path

msg = input("Enter secret message:")
password = input("Enter a passcode:")

d = {}
c = {}

for i in range(255):
    d[chr(i)] = i
    c[i] = chr(i)

m = 0
n = 0
z = 0

for i in range(len(msg)):
    img[n, m, z] = d[msg[i]]
    n = n + 1
    m = m + 1
    z = (z + 1) % 3

cv2.imwrite("encryptedImage.jpg", img)
os.system("start encryptedImage.jpg")  # Use 'start' to open the image on Windows

message = ""
n = 0
m = 0
z = 0

pas = input("Enter passcode for Decryption")
if password == pas:
    for i in range(len(msg)):
        message = message + c[img[n, m, z]]
        n = n + 1
        m = m + 1
        z = (z + 1) % 3
    print("Decryption message:", message)
else:
    print("YOU ARE NOT auth")
```

Ln: 15 Col: 0

IDLE Shell 3.13.2

File Edit Shell Debug Options Window Help

```
Python 3.13.2 (tags/v3.13.2:4f8bb39, Feb  4 2025, 15:23:48) [MSC v.1942 64 bit (AMD64)]
on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========================= RESTART: D:\stego\stego.text =========================
Enter secret message:Name:B.Sathishkumar Bank:State bank of india Ac No:12345678910 Pin:
1819
Enter a passcode:1234
Enter passcode for Decryption1234
Decryption message: Name:B.Sathishkumar Bank:State bank of india Ac No:12345678910 Pin:1
819
>>>
```

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Watchlist Ideas Search ENG US 1:09 PM 2/17/2025

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```

Ln: 9 Col: 0

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CONCLUSION

Summary of Key Points:

Steganography offers a viable solution for secure data handling in images.

The technology is accessible and can be implemented with minimal resources.

Final Thoughts:

Importance of ongoing research and development in steganography. Encouragement for users to adopt secure data handling practices.

GITHUB LINK

https://github.com/SathishKumarsunny/AICTE-----project.git

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FUTURE SCOPE(OPTIONAL)

Advancements in Steganography:

- **Development of more robust algorithms to resist detection.**
- **Integration with other security measures (e.g., encryption).**

Potential Research Areas:

- **Exploring steganography in video and audio files.**
- **Applications in emerging technologies (e.g., IoT, blockchain).**

Call to Action:

- **Encourage collaboration and innovation in the field of secure data handling.**

THANK YOU