Implementation of 3-D Pythocrypt with Image Steganography

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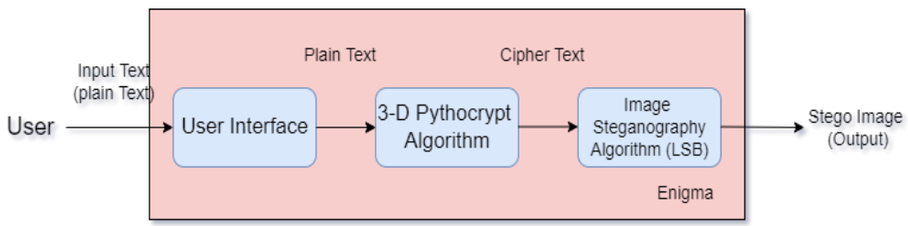
INTRODUCTION

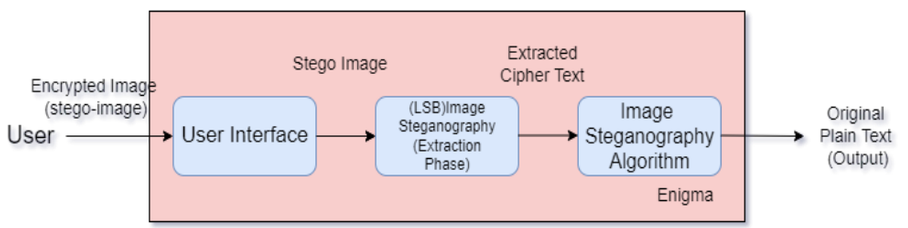
The research work describes an attempt to integrate the 3-D Pythocrypt cryptographic technique with Image Steganography and provide better security for message transmission. 3-D Pythocrypt is a new technique where we use the properties of 3-D geometric shapes to encrypt and decrypt plain text. Image-Steganography is a cryptographic technique used to hide the information within the pixel of the Image.

CONTRIBUTION

The system combines the two different techniques i.e., 3-D Pythocrypt and Image-Steganography to form a complex system that provides confidentiality to our message and also provides security by hiding the information inside the image. Instead of using traditional Image-Steganography which hides the text inside the image, here, the image contains the ciphertext which is the output of the 3-D Pythocrypt algorithm. The whole system can be constructed as a tool that encapsulates these two techniques and provides a high level of abstraction to the end-users.

PROSPOSED METHOD





The shaped used in this hypothesis a octahedron, which can be represented as two pyramids.

Volume of a pyramid = (base area * height) / 3

The volume of octahedron = 2 * Volume of Pyramid

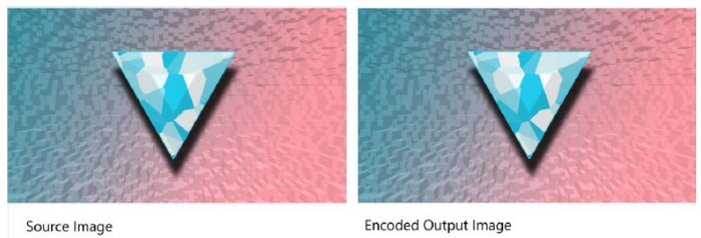
Volume of octahedron = 2 * v

Where, v = (a_2 3

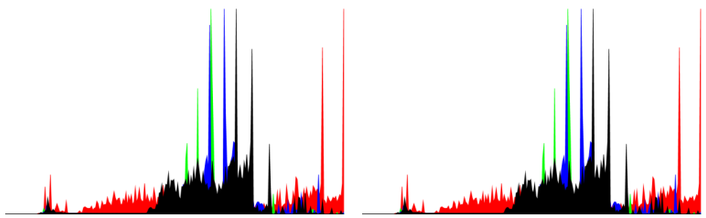
Hence, the volume of the octahedron is derived as,

Vol. of Octahedron = (2 * a^2 * h) / 3

RESULTS



Histogram source image vs Output image



Conclusion

- The 3-D Pythocrypt along with Image-Steganography is a new technique that can be implemented to attain a higher security level along with secrecy.
- It provides better security than most of the existing cryptographic techniques and is infeasible for cryptographic attacks.
- Only some part of the numerical values can be obtained and also it is infeasible to find the original plain text by observing the pattern of ciphertext.

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Dewangga, I.G.A.P. & Purboyo, Tito & Nugrahaeni, R.A.. (2017). A new approach of data hiding in BMP image using LSB steganography and caesar vigenere cipher cryptography. International Journal of Applied Engineering Research. 12. 10626-