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A method for covertly embedding encrypted information into raster images using coordinate masking

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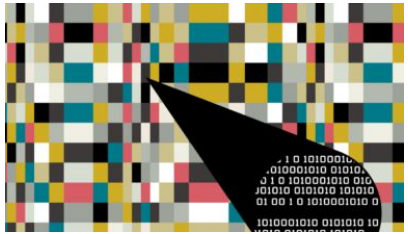
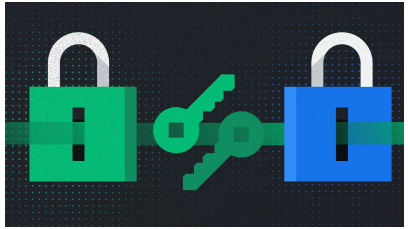
Relevance and purpose of the work

1. Increasing the level of protection of confidential information.

2. Combining the advantages of cryptography and steganography.

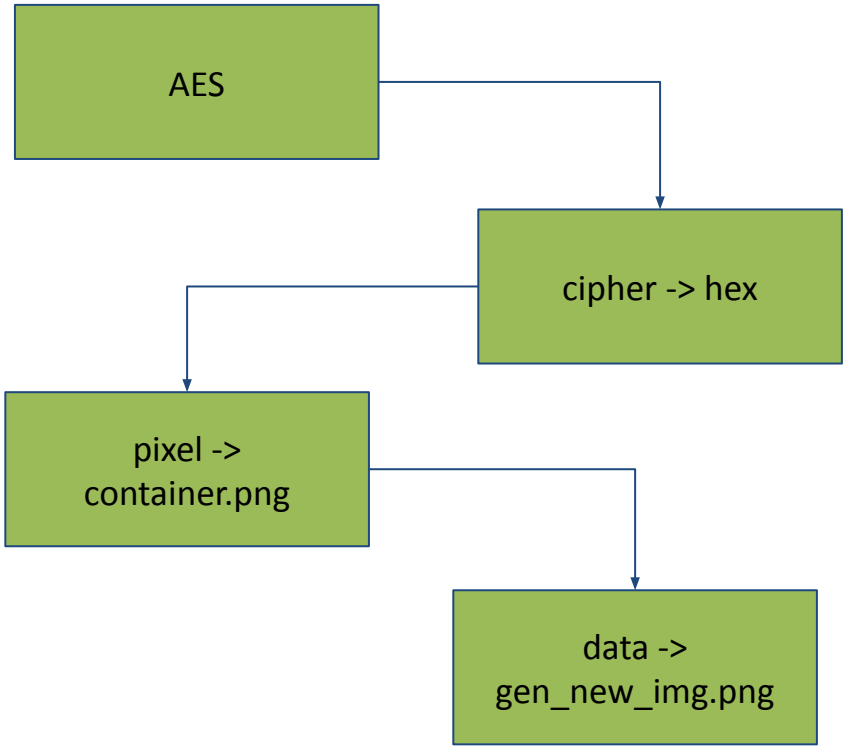
3. Developing a method that provides both encryption and hiding text in an image.



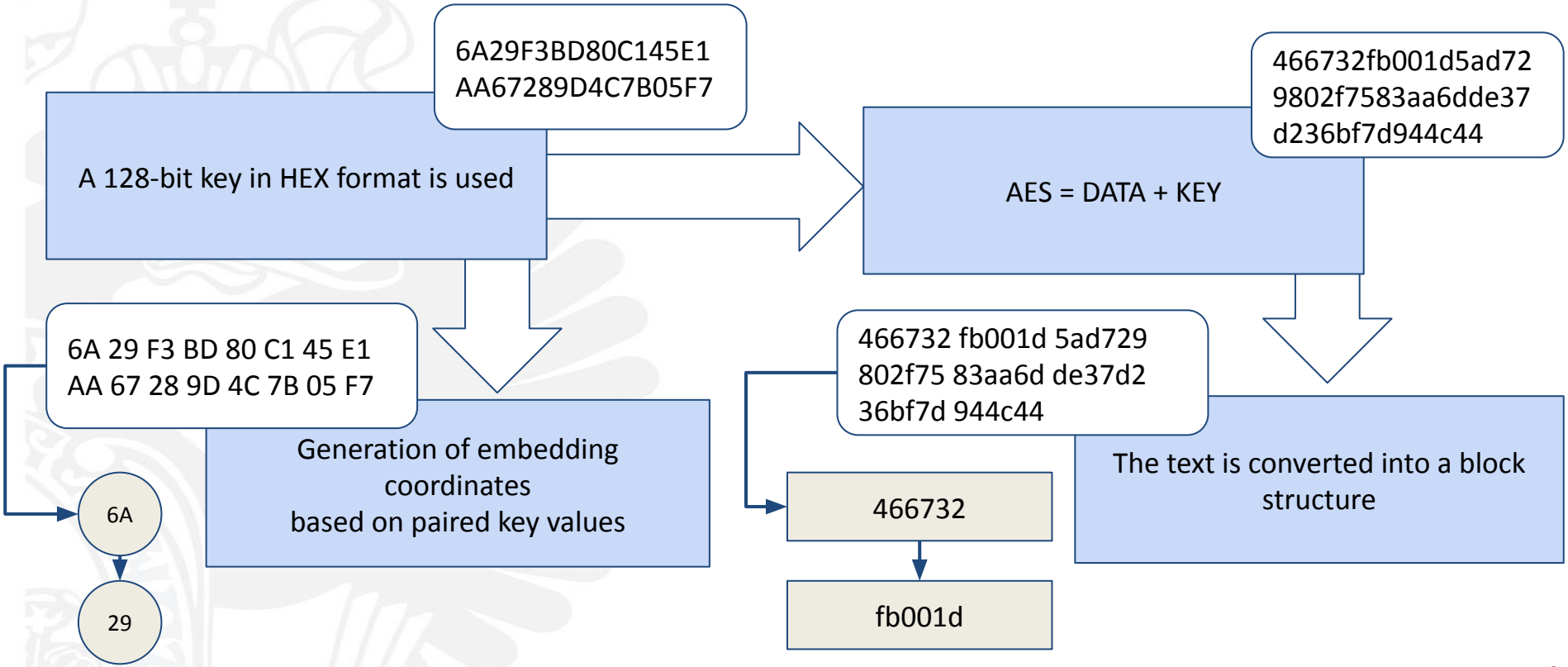


Brief description of the method

- The symmetric encryption algorithm AES (128 bit) is used.
- The encrypted text is converted to hexadecimal format.
- Container: PNG image.
- Data injection is a visual steganography method.

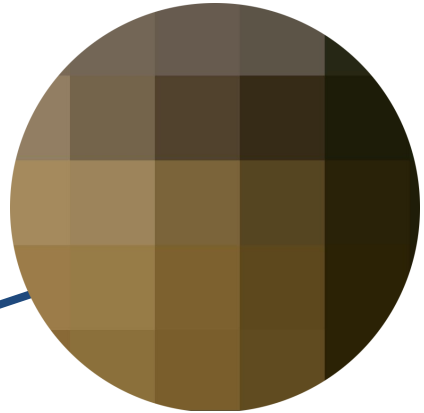


Processing stages



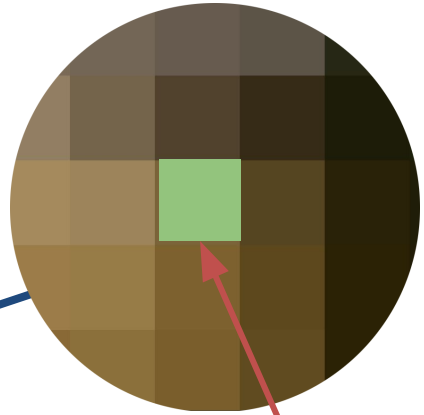
Processing stages

Embedding into an image
the color pixels of the image are modified



Processing stages

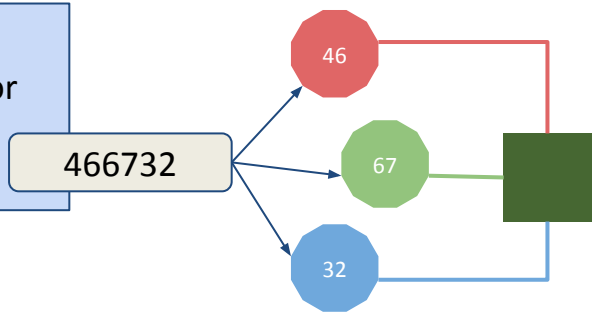
Each HEX block of ciphertext is embedded into a fragment of the image



Pixel modification

Coding principle

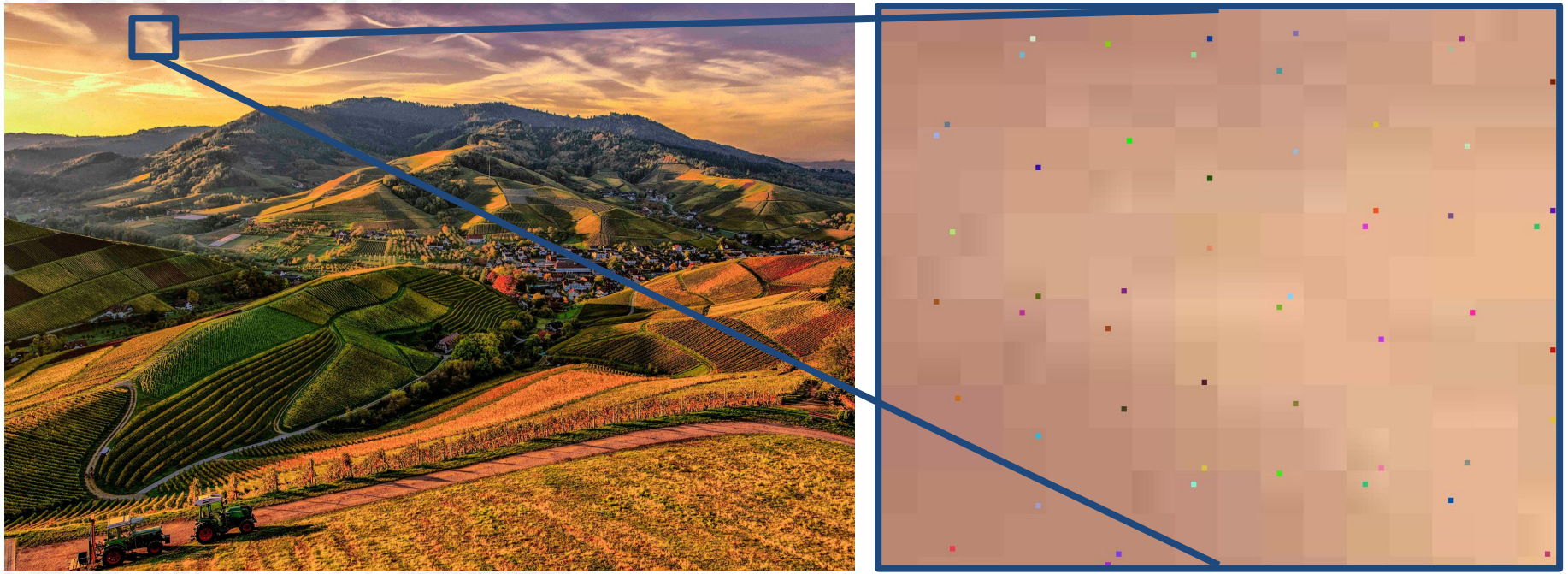
One block of ciphertext → one RGB color value



The image is segmented into equal areas

Demonstration

Demonstration

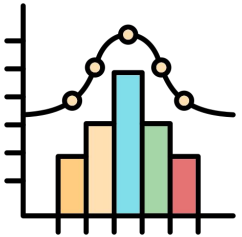


Advantages of the proposed method

Double level of protection: cryptography + steganography

Invisibility for the observer (visually the image is almost indistinguishable from the original)

High resistance to analysis and interception



Conclusion

- The proposed method effectively combines the strength of AES and the secrecy of steganography.
- Suitable for protecting critical text information.
- Adaptation to other file types and encryption is possible.

Thank you for attention!