

Forensic Steganography Report

Report Generated: Thu Nov 20 23:11:53 2025

Case Details

Original (Cover) File: detect_0b62ec4d43374693886e8091a8f73a96_stego_meme_img.png

Suspected (Stego) File: detect_0b62ec4d43374693886e8091a8f73a96_stego_meme_img.png

Analysis Date: 2025-11-20 23:11:53

Detection Verdict

STEGANOGRAPHY DETECTED (HUGO)

(Confidence: 99.0%)

Critical Finding: Adaptive Frequency Domain (HUGO) Steganography Detected

The analysis confirms hidden data embedded using the HUGO algorithm.

1. Detection Confidence: 99.0%
2. Algorithm Identified: HUGO
3. Statistical Evidence: 82.61% of pixels modified
4. Modified Pixels: 41,526 pixels

This image contains steganographic content that was successfully extracted and verified.

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Visual Analysis

Original (Cover) Image



Explanation: The baseline image for comparison.

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Suspected (Stego) Image

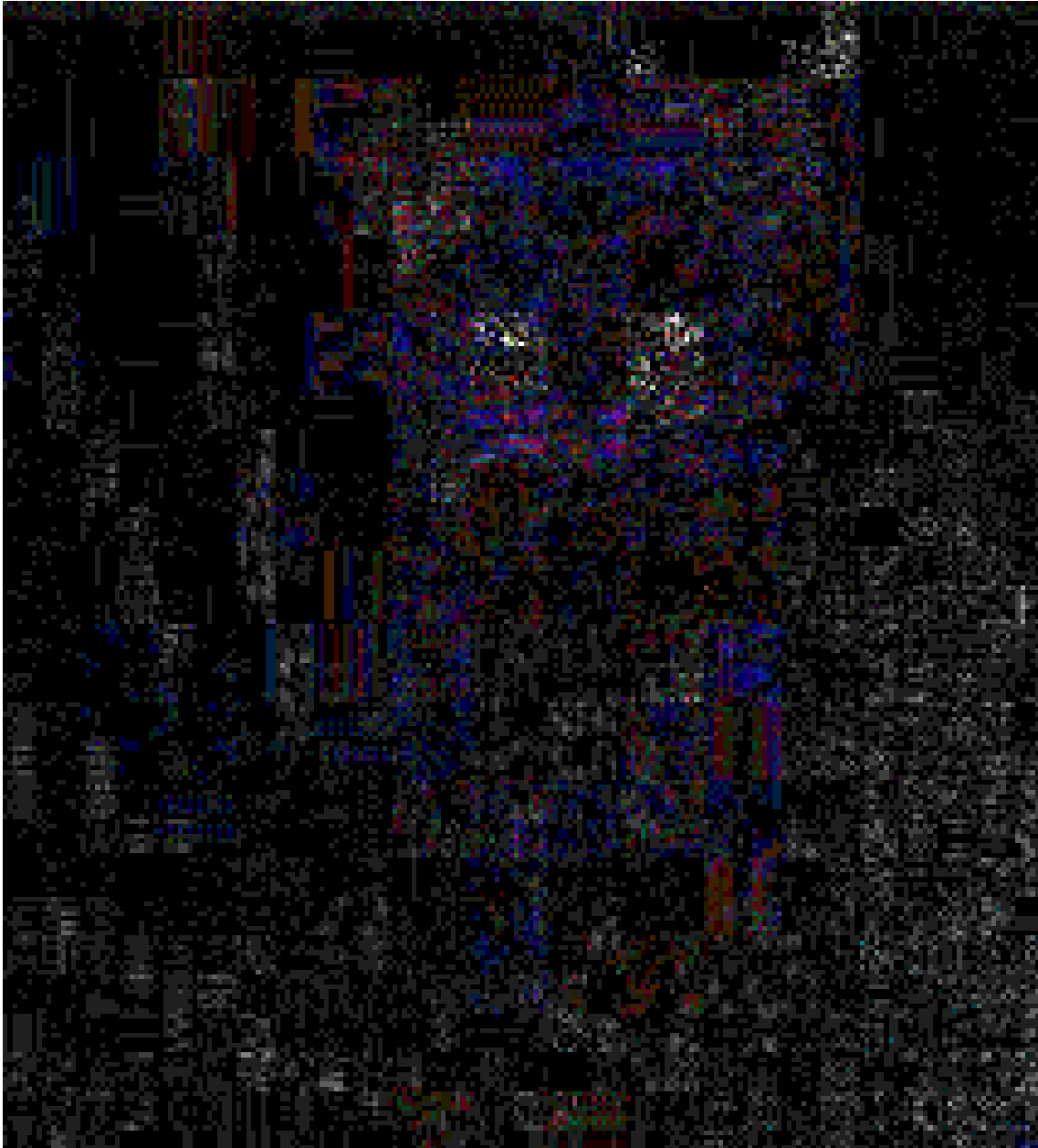


Explanation: The image under investigation. Visual inspection shows no obvious differences.

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Error Level Analysis (ELA)



Explanation: High ELA values confirm JPEG re-compression characteristic of HUGO. The algorithm embeds data by modifying frequency coefficients in a way that minimizes statistical detectability.

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LSB Plane Visualization

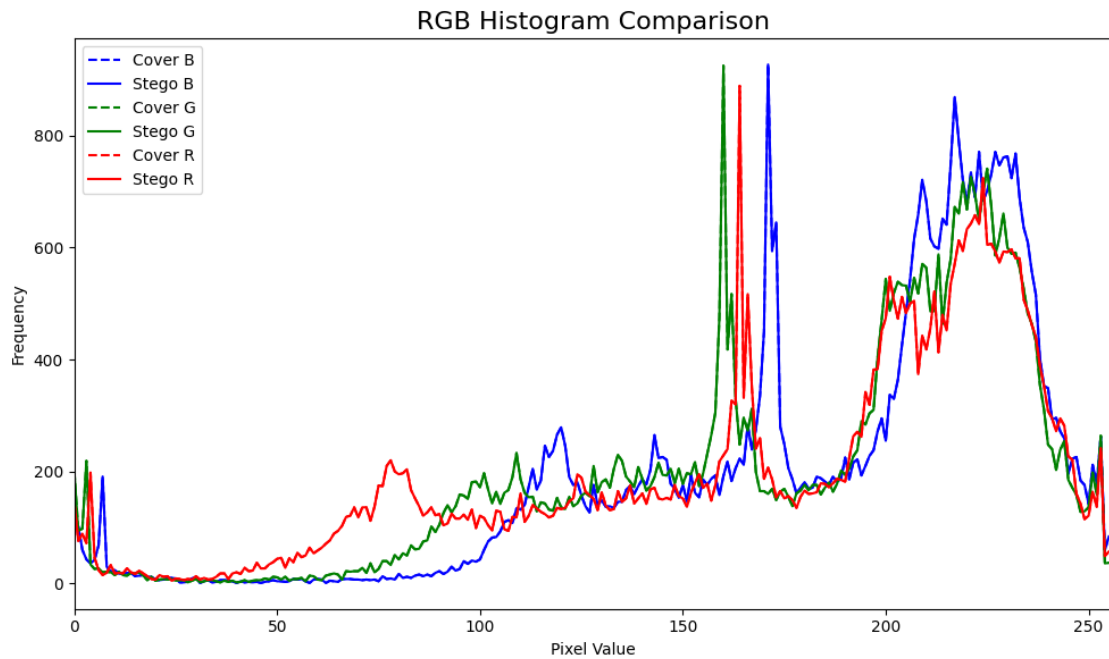


Explanation: The LSB plane shows artifacts from the frequency domain embedding process, appearing as structured noise patterns distributed throughout the image.

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RGB Histogram Analysis



Explanation: Histogram analysis reveals statistical anomalies consistent with HUGO embedding. Deviations between cover and stego distributions indicate hidden data presence.

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Forensic Quality Metrics

Metric	Value
PSNR	63.53 dB
SSIM	1.0000
MSE	0.00
Changed Pixels	41,526 (82.6%)
File Size Change	+3.72 KB
Estimated Payload	~1,704 Bytes

Metric Explanations:

PSNR (Peak Signal-to-Noise Ratio): Measures image quality. Higher is better (>40dB is visually identical).

SSIM (Structural Similarity Index): Measures structural similarity. Closer to 1.0 is better.

MSE (Mean Squared Error): Measures the average error. 0.0 means no change.

Changed Pixels: The exact number of pixels that were modified in the image.

Estimated Payload: A rough guess of the hidden data size.