

Forensic Steganography Report

Report Generated: Thu Nov 13 20:58:12 2025

Case Details

Original

(Cover)

File:
detect_3159bcdece124cc7bc8359d4a9a7313c_stego_52c1f3d2aa584e498f145dbc9de07f4a_image.png

Suspected

(Stego)

File:
detect_3159bcdece124cc7bc8359d4a9a7313c_stego_52c1f3d2aa584e498f145dbc9de07f4a_image.png

Analysis Date: 2025-11-13 20:58:12

File Size Analysis

| Property | Cover Image | Stego Image |
|------------------|-------------------|-------------|
| File Size | 424.65 KB | 424.65 KB |
| Image Dimensions | 976 x 549 | 976 x 549 |
| Size Difference | +0.00 KB (+0.00%) | |

Size Analysis Conclusion:

Minimal file size change detected. This could indicate: LSB steganography, no embedding, or efficient compression.

Detection Verdict

STEGANOGRAPHY DETECTED (WOW)

(Confidence: 97.1%)

Critical Finding: Adaptive Frequency Domain (WOW) Steganography Detected

The analysis confirms hidden data embedded using the WOW algorithm.

1. Detection Confidence: 97.1%
2. Algorithm Identified: WOW
3. Statistical Evidence: 65.29% of pixels modified
4. Modified Pixels: 349,852 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.

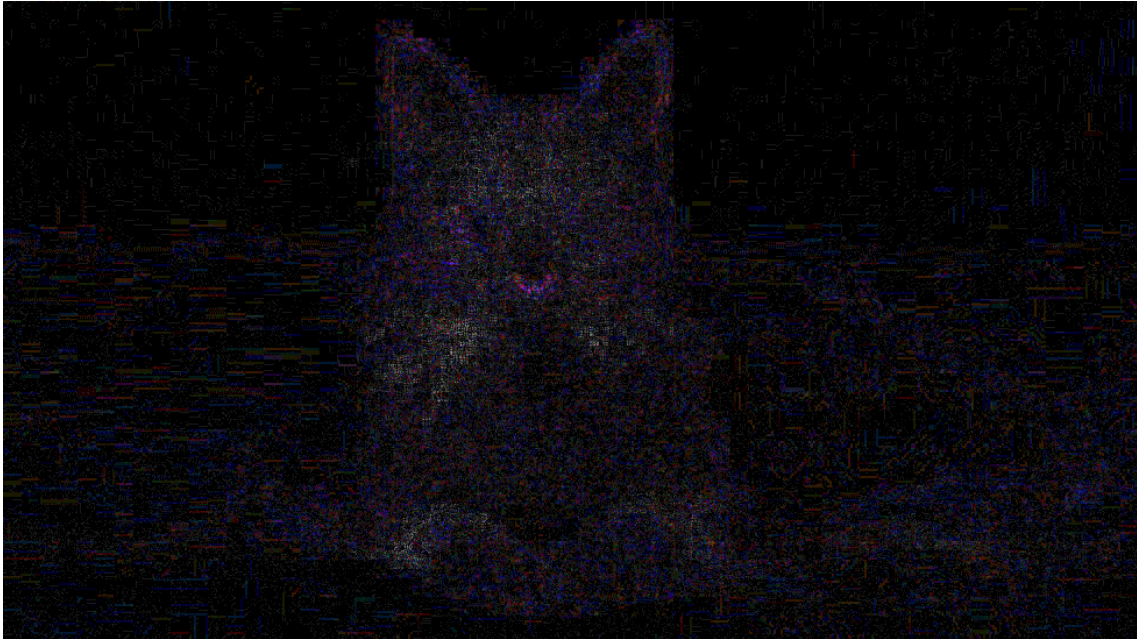
Pixel Difference Map

Explanation: Widespread changes (65.3% of pixels) indicate frequency domain embedding. The WOW algorithm modifies DCT coefficients across the entire image to hide data while maintaining visual quality.

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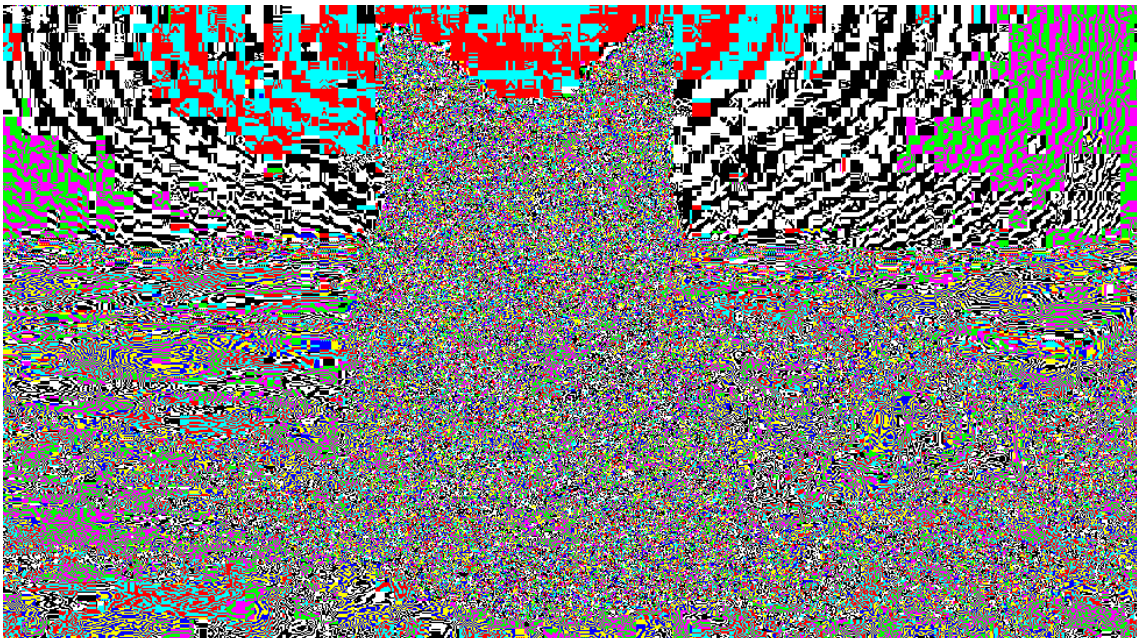
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Error Level Analysis (ELA)



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

LSB Plane Visualization

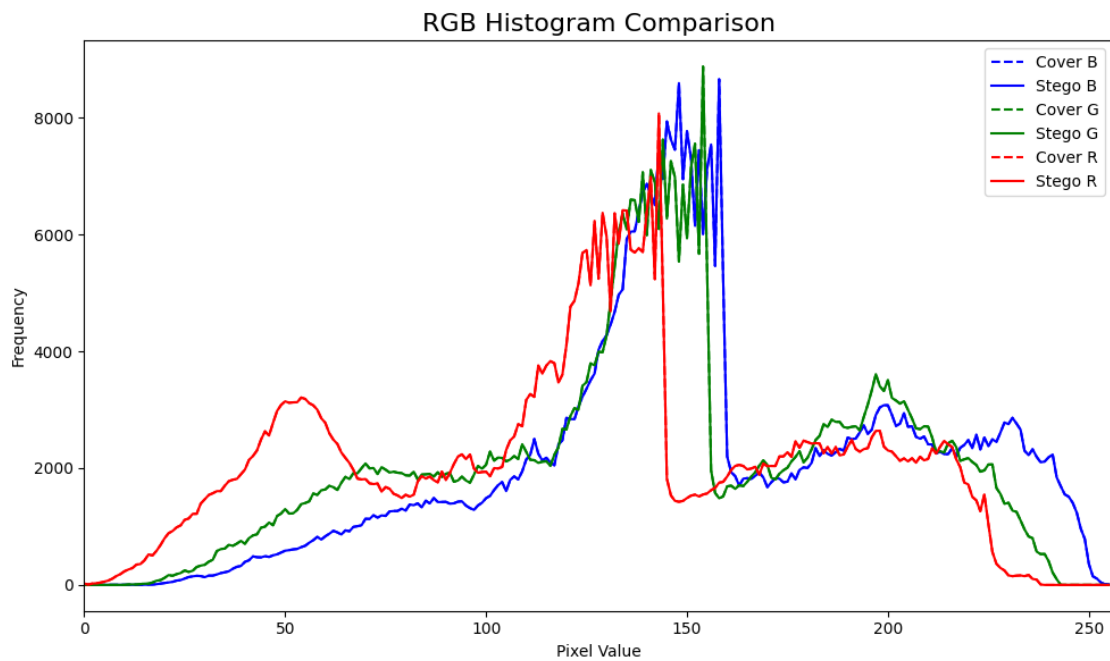


Explanation: The LSB plane shows artifacts from the frequency domain embedding process, appearing as structured noise patterns distributed throughout the image.

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RGB Histogram Analysis



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

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Forensic Quality Metrics

| Metric | Value |
|-------------------|-----------------|
| PSNR | 59.55 dB |
| SSIM | 1.0000 |
| MSE | 0.00 |
| Changed Pixels | 349,852 (65.3%) |
| File Size Change | +0.00 KB |
| Estimated Payload | ~920 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.