Forensic Steganography Report

Report Generated: Thu Nov 13 20:46:00 2025

Case Details

Original (Cover) File: detect_041990099ad346be9da7df02233bb1d4_stego_52c1f3d2aa584e498f145dbc9de07f4a_image.png

Suspected (Stego) File: detect_041990099ad346be9da7df02233bb1d4_stego_52c1f3d2aa584e498f145dbc9de07f4a_image.png

Analysis Date: 2025-11-13 20:46:00

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: 91.9%)

Critical Finding: Adaptive Frequency Domain (WOW) Steganography Detected

The analysis confirms hidden data embedded using the WOW algorithm.

1. Detection Confidence: 91.9%

2. Algorithm Identified: WOW

3. Statistical Evidence: 80.82% of pixels modified

4. Modified Pixels: 433,070 pixels

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

Forensic Steganography Report

Report Generated: Thu Nov 13 20:46:00 2025

Visual Analysis

Original (Cover) Image

Explanation: The baseline image for comparison.

Forensic Steganography Report

Report Generated: Thu Nov 13 20:46:01 2025

Suspected (Stego) Image

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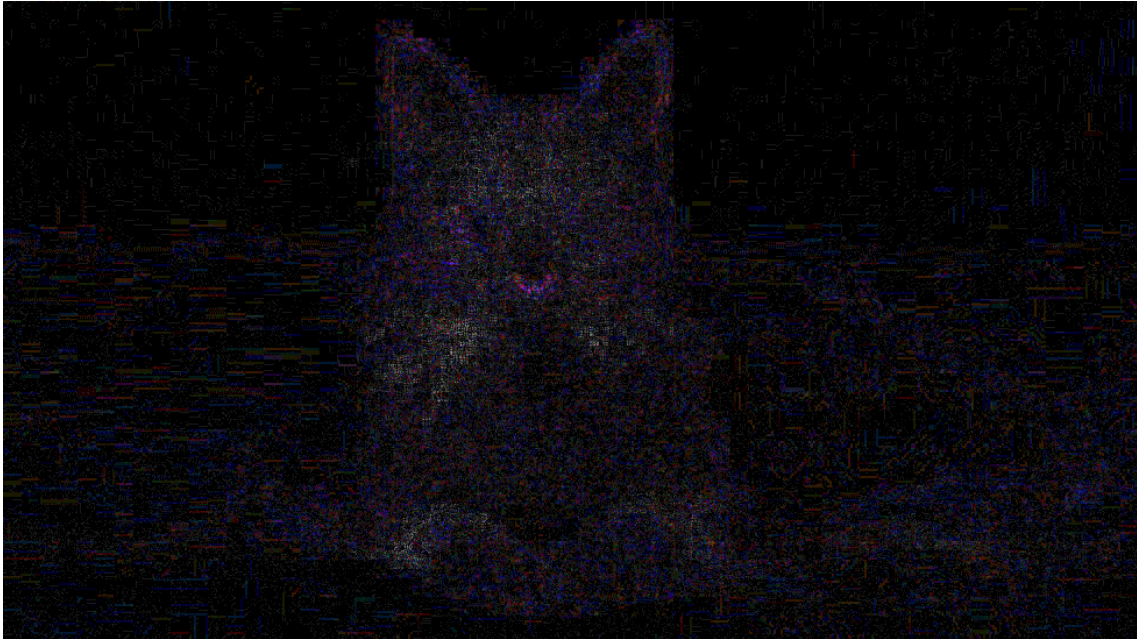
Pixel Difference Map

Explanation: Widespread changes (80.8% of pixels) indicate frequency domain embedding. The WOW algorithm modifies DCT coefficients across the entire image to hide data while maintaining visual quality.
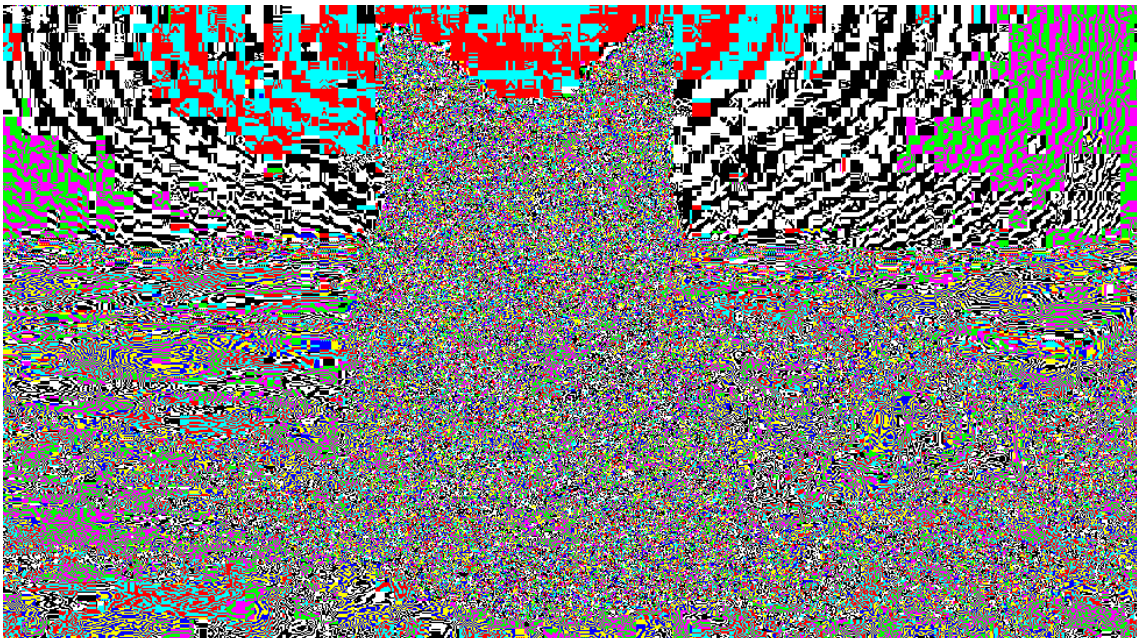
Forensic Steganography Report

Report Generated: Thu Nov 13 20:46:01 2025

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.
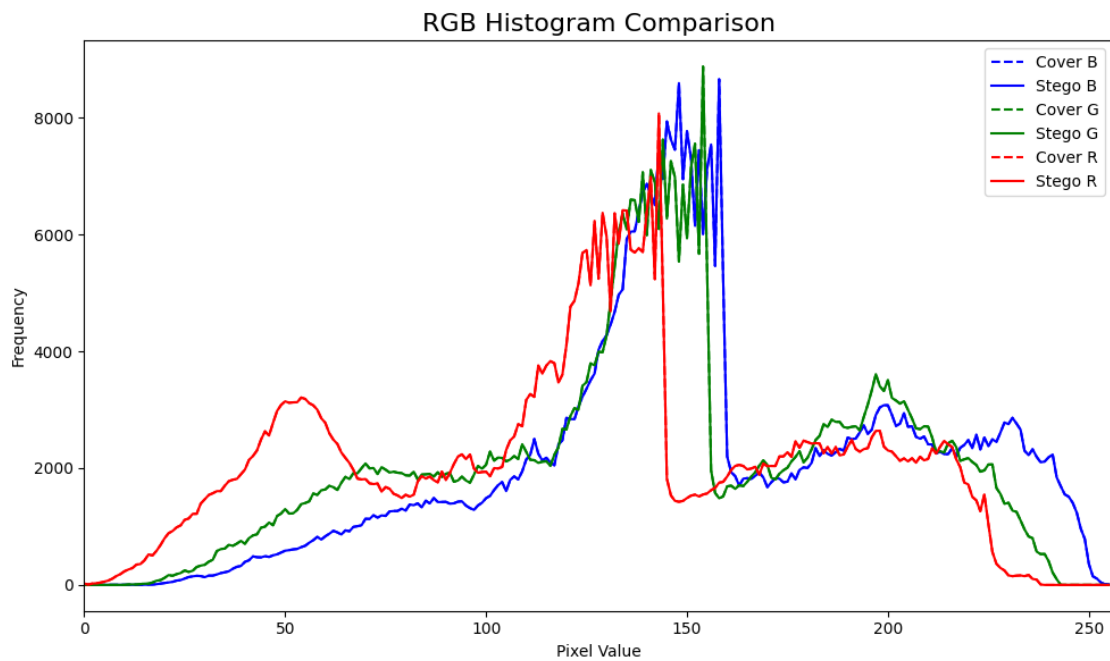
LSB Plane Visualization

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

Forensic Steganography Report

Report Generated: Thu Nov 13 20:46:01 2025

RGB Histogram Analysis

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

Forensic Steganography Report

Report Generated: Thu Nov 13 20:46:02 2025

Forensic Quality Metrics

Metric	Value
PSNR	55.31 dB
SSIM	1.0000
MSE	0.00
Changed Pixels	433,070 (80.8%)
File Size Change	+0.00 KB
Estimated Payload	~4,666 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.