

Detecting Synthetically Generated Images

Preamble

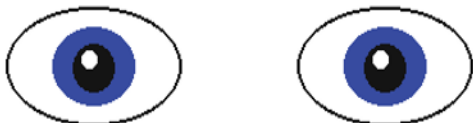
AI-generated images using Generative Adversarial Networks (GANs) as well as diffusion models like Stable Diffusion, Midjourney and DALL-E 3 are now being used in practice by hostile actors for propaganda purposes such as fabricating atrocities, faking identities, making fake evidence and influencing online conversations. The ten advisory points below provides guidance on detection procedures that apply to GAN-generated and diffusion models-produced images.

Ten-Point Advisory

1. Examine Eye Symmetry and Corneal Reflections.

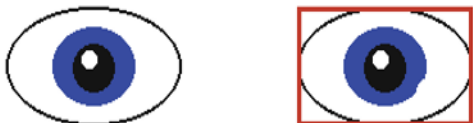
In the case of faces created using GANs (especially StyleGAN versions), there is often an inconsistency with regards to the source of light from which corneal highlights come, where one eye will show a highlight on its top-left side while the other eye will show a highlight in its bottom-right side and that cannot happen given only one source of light.

POINT 1 — Eye Symmetry & Corneal Reflections (GAN-generated faces)
Left/right corneal highlights from contradictory light sources — GAN indicator

AUTHENTIC — Eye Region (max zoom)


LEFT EYE RIGHT EYE

Both corneal highlights: top-left
Single consistent light source
☑ Authentic indicator

GAN DEEPPFAKE — Eye Region (max zoom)


LEFT EYE RIGHT EYE

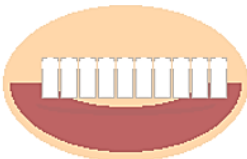
LEFT: highlight top-left
RIGHT: highlight bottom-right
☐ Physically impossible — 2 light sources = GAN artefact

Note: Diffusion models (Midjourney, DALL-E 3) handle reflections better; this indicator is strongest for StyleGAN-generated faces.

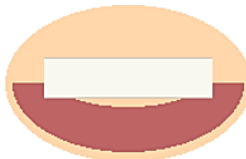
2. Scrutinise Teeth and Oral Interior Rendering.

The AI images that generate dentition do not allow for any inter-dental spaces between teeth, variation in gums and the true anatomy of the mouth. Each tooth may join together and form one solid mass without any borders between each tooth. Zoom in on the highest resolution to observe the difference.

POINT 2 — Teeth & Oral Interior Rendering Failure
AI models produce merged, uniform dentition without inter-tooth spacing

AUTHENTIC — Close-up Smile


✓ Individual tooth outlines
✓ Natural size variation
✓ Distinct gum margin

AI-GENERATED — Close-up Smile


⚠ Teeth fused — no individual outlines
⚠ Implausible uniformity
⚠ No inter-tooth spacing

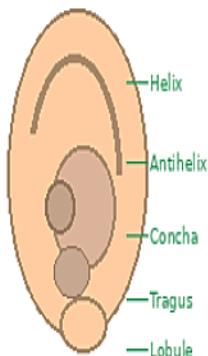
3. Inspect Ear Geometry and Fine Anatomical Detail.

Human ears are extremely intricate structures, with components like the helix, antihelix, concha, tragus, antitragus and lobule. However, AI ears always come out looking like an oval-shaped lump without any features such as the antihelix bend, tragus and lobule. Any ear showing this sort of uniform simplicity is definitely computer generated.

POINT 3 — Ear Geometry Degradation (Pinna)

AI ear lacks antihelix, tragus, antitragus, and lobule anatomical detail

AUTHENTIC EAR — Outer Ear Anatomy



- ✓ Helix, antihelix, concha, tragus visible
- ✓ Lobule distinct and natural
- ✓ Inner ear canal shadowing

AI-GENERATED EAR — Outer Ear Anatomy



- △ Simplified oval blob — no sub-structure
- △ No tragus or antitragus present
- △ SYNTHETIC — anatomically incomplete

4. Analyse Textural Inconsistency Across the Scene.

AI-created composites will often show the feature of the face being extremely detailed while the background is extremely smooth and not very detailed at all – almost as though the face was created by itself and placed over another image. See if there is a correlation between the level of detail in the face with the texture of the background.

POINT 4 — Textural Inconsistency: Face vs Background

High-detail face (72 DPI equiv.) against smooth background (12 DPI) = composite

AI-GENERATED IMAGE — Texture Forensic Overlay

BACKGROUND:
~12 DPI — SMOOTH
No surface variation
= SYNTHETIC



FACE ZONE:
~72 DPI — SHARP
High detail retained
= COMPOSITE

DIAGNOSIS: Mismatched resolution zones indicate face and background generated separately — COMPOSITE artefact.

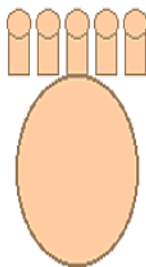
5. Check Hand and Finger Rendering.

Human hands continue to be an Achilles heel in generative AI. Count fingers (five per exposed hand), measure finger joint proportions, examine nails and observe skin folds at finger joints. Note: Midjourney v6 and DALL-E 3 (2024 onwards) generate better hands, but this test is crucial nevertheless. The presence of six fingers or webbed digits is a guaranteed AI signature in all AI models.

POINT 5 — Hand & Finger Rendering (Persistent AI Failure Mode)

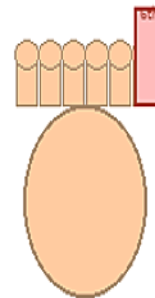
AI may generate 6 fingers; note: Midjourney v6+ and DALL-E 3 have improved this

AUTHENTIC — 5 Fingers



- ✓ 5 fingers detected
- ✓ Correct phalanx proportions
- ✓ Natural knuckle detail

AI-GENERATED — 6 Fingers



- ⚠ 6 fingers detected
- ⚠ Extra digit: anatomically impossible
- ⚠ CHECK: newer models improving on this

6. Detect AI Spectral Fingerprints Using Frequency Analysis.

Upload photos to FotoForensics (fotoforensics.com) using Error Level Analysis (ELA) or upload photos to 29a.ch/forensically for analysis in the frequency domain. Photos generated by AI have distinct features; the diffusion process creates distinct noise patterns and does not possess the double-compression feature of real photos. Photos generated by GANs show periodic peaks in spectra due to upsampling layers.

POINT 6 — Error Level Analysis (FotoForensics / 29a.ch Forensically)

ELA reveals face composited over background: different compression history

ORIGINAL IMAGE



ELA OUTPUT — Compression Artefact Map



- LOW ELA (dark) = original background data
- BRIGHT RED = inserted/composited face region
- DIAGNOSIS: Face was composited from a different source

7. Perform Reverse Image Search Across Multiple Engines.

Search the same image in reverse simultaneously via Google Images, TinEye (tineye.com) and Yandex Images. Yandex is especially good at sourcing image results that relate to South/Central Asia contextually. A picture which is supposed to portray an ongoing event, but in reality is sourced from an old stock photo database, makes for direct proof of disinformation.

POINT 7 — Reverse Image Search (Google Images, TinEye, Yandex)

Image claimed as current event traced to 7-year-old stock photo archive

CIRCULATING IMAGE — Claimed: June 2026



TinEye

ACTUAL SOURCE — TinEye Reverse Search

First appearance:

Getty Images Archive — March 2019

Context: NATO Press Briefing, Brussels

Image predates claimed event by 7 years

VERDICT:

Old photo + false caption = DISINFORMATION

Cross-check on Yandex (effective for Indian/

South Asian contexts) also confirms 2019 date.

ALWAYS use 3 search engines simultaneously.

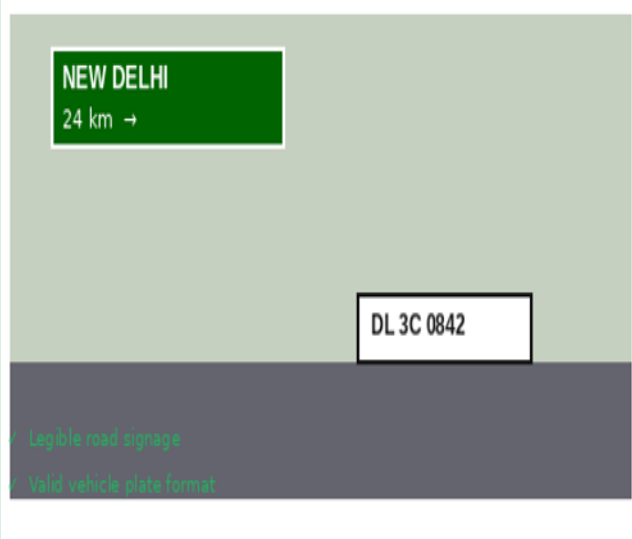
8. Verify Textual Elements Embedded Within the Image.

Image generators are always bad at drawing coherent text on an image. Look for all text elements in signs along the road, license plates on cars, badges, official documents, newspaper headlines. If they consist of scrambled letters, letters in multiple languages, incorrect format of license plates or pseudowords (sequences that look like words but aren't actual words), they are definitely generated by an AI.

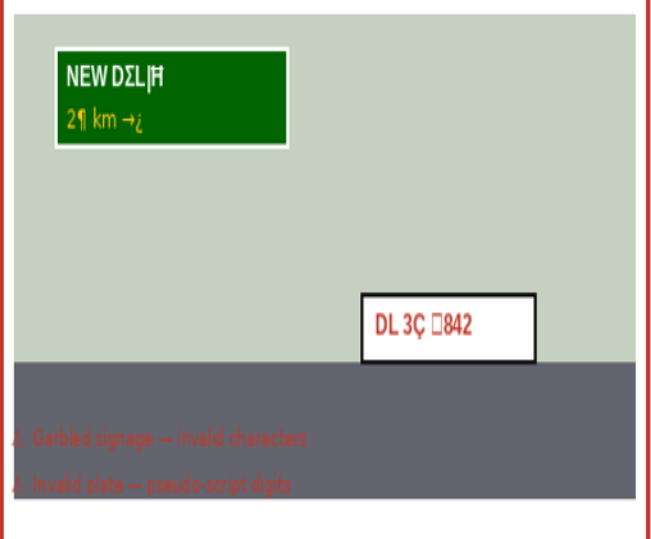
POINT 8 — Garbled Text Within AI-Generated Images

Road signage and vehicle plates degrade to pseudo-script in AI scenes

AUTHENTIC PHOTOGRAPH



AI-GENERATED IMAGE



9. Assess Shadow Direction and Lighting Physics.

Ensure that all shadows cast in the photograph follow the same direction or are derived from a real-world source of light. Shadows from AI-generated photos are typically inconsistent in direction; e.g., a person's shadow points toward the left-hand side whereas a tree's shadow on the same image points toward the right-hand side.

POINT 9 — Contradictory Shadow Physics

Subject's shadow (left) contradicts tree's shadow (right) — separate generation



10. Validate Through EXIF Metadata Extraction.

Utilise either ExifTool (command line version), Metadata2Go (metadata2go.com) or pic2map.com for investigating the EXIF metadata tags. Note that Jeffrey Friedl's Exif Viewer service closed down permanently in 2023. Original photos have camera brand/model, lens focal length, aperture, shutter speed and usually GPS info included. AI-produced photos do not normally have any camera metadata included or else will list the AI application name used (Stable Diffusion, Automatic1111 WebUI, Midjourney) in the Software/Comment tags.

POINT 10 — EXIF Metadata Extraction (ExifTool / Metadata2Go / pic2map.com)

Jeffrey Friedl's viewer shut down 2023. Use ExifTool, Metadata2Go, or pic2map.com

Metadata2Go.com — Image Metadata Report (ExifTool compatible)

FIELD	VALUE	ANALYSIS
Make	—	⚠ Missing — authentic photos always have this
Model	—	⚠ Missing — camera model not recorded
Software	Automatic1111 Stable Diffusion v2.1	⚠ AI generation software — CONFIRMS synthetic
Date/Time Original	—	⚠ No capture timestamp — not a real photograph
GPS Info	—	⚠ No location data
Image Description	cfg_scale=7, steps=30, sampler=DPM++	⚠ AI generation parameters embedded
Comment	Prompt: soldier press conference India	⚠ AI prompt text found in metadata
Compression	JPEG Quality 95 (re-saved 2x)	⚠ Re-saving destroys authentic compression chain
Company	—	⚠ Institutional images always show organisation