# Homework: Reflection on Detecting Fake Images

## Learning objectives:

Students will be able to reflect on designing systems and processes for detecting fake images or mitigating accusations of fake images.

## Task:

Watch this video on [award winning photographers who cheated](https://www.youtube.com/watch?v=WXAavnORAxg&ab_channel=ThomasHeaton). The video describes real photographers who cheated and won in prestigious competitions. Consider how we as digital forensic professionals and as IS professionals can create systems to catch or prevent cheating. IS systems include software but also includes people, business rules, and processes. In a Word document, write answers to these two questions.

1. Pretend National Geographic has hired you to consult with them regarding their yearly nature and wildlife photo competition. How might you consult with them? If available, what algorithms might you recommend? What competition rules or business rules might you recommend helping judges investigate if an image is modified? Consider what processes you might recommend. Consider referencing the scholarly article we read or finding another reference. Make assumptions as needed. There is no right answer. This is an opportunity to think about and express possible improvements to systems and processes. Write a few paragraphs.

Starting with a few competition/business rules that would help the investigative process and even the process before the photos are submitted to be judged. Firstly, I believe administering professionals hired by Nat Geo to monitor the photography process of the contestants would be very effective. The professional would be able to take responsibility for the photographer and either defend or report the photographer if anything is to happen. Now, the main problem I see with this is that you must have an official list of contestants, and for each one, a professional partnered with them throughout the process. Logistically speaking this could be difficult to pull off. This also would do nothing in the way of modifications to the photo after it has been taken, which in my opinion is not a glaring issue for a Nat Geo photo competition. I would think most contestants in something of this level would either know the rules or simply realize that editing a photo is going to get them disqualified and possibly blacklisted from future competitions. This brings me to my next point, which is more heavily punishing those who cheat in these competitions. Blacklisting would be the most worthwhile because it both instills diligence and integrity within a photographer realizing the heavy consequence, while being able to prevent a blacklisted photographer from participating in other photo competitions. I say this because if a contestant were to get blacklisted from a Nat Geo competition, other organizations would more than likely avoid that photographer or bar them from entry in a competition. All of this discourages photographers from cheating in some way.

In terms of algorithms I would recommend using, there are a few in this regard too. Beginning with if an image is AI generated, I believe an algorithm that scrutinizes certain aspects/patterns in photos can be effective here. What I mean is that in most AI generated images, there is almost always an abnormality or warping in the image that is hiding in plain sight. AI imagery generation tools tend to mess up complex things such as eyes and fingers/toes. Looking at fingers is a crucial determiner of an image being AI generated, if an image includes them of course. Many times, the AI will either add or remove fingers in the image, making it obvious the image is not real. Another thing I have noticed is the blurring of certain areas of images. For example, an image of a person with glasses on, the AI will tend to blend the temples and frame of the glasses into the skin. Finally, a pattern amongst AI images is the smoothness of faces and the picturesqueness of the sky. If an image includes only a few, detailed looking people, many times the faces will be overly smooth and glossy/shiny, making the people look rather cartoonish. As for the sky, I have seen AI generated images where there is a beautiful, star-filled night sky above a cityscape. The thing to consider with this is that light pollution exists inside of the city, the night sky looks nowhere near as good in reality. Generally speaking, AI uses unrealistic colors with the sky, regardless of if it is day or night. Of course, there are many levels of AI imagery generation tools with some of the high-end ones being convincing.

With all that being said, there *are* AI generated image detection tools that can be used to counter AI generated images winning contests. As with every solution, there is a drawback, that being that these tools are all different and should not be used alone. Using multiple versions of these tools can ensure no images slip through, because there are ones that cannot recognize AI imagery where some can. Additionally, if an image is not AI generated but there is still suspicion of illegal modification of the image, steps can be taken to prevent this from happening. Having strict guidelines regarding making the contestants release the raw file/files of their entry is what I feel would be most effective in this case. Other than that, the topic about punishment I covered in the first paragraph I feel like is useful in deterring cheating through modification of the photo.

1. If you were a photographer, what steps might you take in advance of submitting your photo to a competition so that you are not accused of cheating or can defend yourself if accused. Consider the content and rules described in the cheating video viewed earlier. Make assumptions as needed. There is no right answer. Write a paragraph or two. This question assesses your creative thoughts and communication.

The primary action I would take to prevent accusations of cheating in a competition like this would be to release the raw files of both the main entry and other pictures taken along with it (if any were taken) to the public. This would make sure the public and judges receive some transparency beforehand. Additionally, if any photo editing is allowed, I would share the software I used with the public and judges as well.

The case with the anteater is kind of tricky to counter in my opinion. The only thing I think the photographer could have done to *ensure* it was real is to have a video showing the anteater walking up to the mound along with his photos. Since that did not happen, I feel like he might have been able to argue about the pose of the anteater in his photo compared to the place the taxidermized anteater is located. This of course, only applies if he was telling the truth about his photo. Regardless, I believe using the two methods can stave off any cheating accusations and give the photographer a good defense in most cases.

References

Bogna, J. (2023, July 21). *How to tell if an image is AI generated*. How. https://www.howtogeek.com/904237/how-to-tell-if-an-image-is-ai-generated/

*How to detect AI-generated images*. PCMAG. (n.d.). https://www.pcmag.com/how-to/how-to-detect-ai-created-images

Wu, G. (2023, September 1). *How to identify an AI-generated image: 4 ways*. MUO. https://www.makeuseof.com/how-to-identify-ai-generated-image/

Note: After you do your own thinking and writing, generative AI may be used for additional research and grammar correction (after you write your own ideas) but cannot be used to generate content for this homework assignment. Cite the generative AI tool used for this assignment and how it was used.

## Deliverable:

Submit your Word document or PDF document to \\WTclass\cidm6356\lessons\week 2\homework Reflection on Detecting Fake Images\

## Grading Rubric: 50 points

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| --- | --- | --- |
| Criteria | Excellent (100%) | Subpar (<50%) |
| Creative thought | Imagination, insight, and style. Evidence of synthesizing the materials provided by the professors. Includes thoughts that are feasible in solving the problems or that the professor has not thought of. | Give the appearance of going through the motions. Like an undergraduate paper. Lacks originality. |
| Communication mechanics | Free from distracting errors, concise. Sources cited in APA. | Has distracting errors in spelling, grammar, word choice, run on sentences, wordy (not concise and to the point), etc. Sources used but not cited. |