Tech Program: Are You for Real?

Saturday, September 21, 2024

Ever since the early days of photography, people have manipulated photos to create faked images. Now, digital photography and AI have helped both to make it easier to create fakes and to create more convincing fakes.

In this program we'll look at some digital tools and some low-tech tips and techniques to help determine whether an image is real or fake.

A meeting that never took place, given that Victoria wasn't born until George Washington had been dead for 19 years.

Lower tech fakes

- The Cottingley Fairies
- Theodore Roosevelt riding a moose
- "Nothing Is Impossible: On Authenticity of an Image"

  An article with several historic examples of faked images

Testing images by hand (as it were)

Zoom in

Look for:

- Things in the background that seem off
  - Text that doesn't work (incomplete letters/digits, nonsense)
  - Lack of any content where you might expect to see at least indistinct content. For example:

        - Blank license plates on cars that look close enough that you should at least be seeing the blur of their text.
        - Blurred backgrounds that seem to be close enough that they should have better focus
    - People that look incomplete or otherwise odd (or even bizarre)
        - Extra arms or legs (often in shaded adeas)
        - Extra or missing fingers
        - Arms or legs that are partly behind other objects or people but seem like they wouldn't connect up naturally if you were able to see the obscured part
        - Unnatural fingers or other hand parts (AI has a hard time with hands, but, to be fair, so do most novice artists)
        - "Unnatural" asymmetries like bizarrely paired earrings
        - Teeth with no separation or with unusually wide separation
- People and things that seem too "perfect"
    - Look for lack of pores, blemishes, small asymmetries that people tend to have
    - Perfect circles (or other geometric figures) on natural objects
    - Sometimes this could be the result of a lot of airbrushing on a real image (which is in a way a lower tech version of fakery), but shading and other color/light-level variations might be missing in an AI generated image

Sometimes only 1 thing will seem off.

Run a reverse image search

Use a search engine to see where the image has been used online and what information you can gather from those uses.

Note that this can be useful with totally legit images when (for instance) you want to find who first used the image or who else has used it. It can also be useful for sussing out fraudulent uses of real images, for example, images from one war zone being used as "evidence" for some alleged event in a different war zone.

- TinEye
- General search engines with image searching
    - Bing image search

- Google image search
- Yandex image search

To search an online image by URL with any of the 3 sites while using a mobile device, you'll have to use the **desktop site** option within your browser.

For Bing on mobile you also need to use a browser's desktop site option to search images you've already downloaded or snapped with your camera.

Compare with something known to be real

In some cases, you can compare the image in question with known reality. When the image has specific locations, buildings, sculptures, etc. as part of its content, you might be able to find images of those objects and check the questionable image against the trustworthy.

Research you can guinea pig for (& test your abilities with)

"Detect Fakes: DeepFakes, Can You Spot Them?"

Has 414 images for participants to judge as either real or AI generated

Full disclosure

In preparing for today's program, I judged 100 images in 2 sessions (50/session with a little over a month between them).

In the first session, only 24 of my judgments were correct (slightly worse than chance, though probably not statistically significant) while the average user who judged the same images that I did correctly identified 38.10.

In the 2nd I correctly identified 36 of the 50 images (compared to 36.13 for the general participant).

Some of the difference could be from images that were common to both sessions (there were at least 4 that I remembered from the 1st session, and the expected number in common is slightly more than 6), but some that I know I had seen in the first session I incorrectly labeled in the 2nd (D'oh!).

Another difference, though, was that I was using the tips in the "Zoom in" section above (in particular, I opened each image in a separate tab and, well, zoomed in). Also, I had done more reading in between and realized that image generators had gotten more sophisticated, that I would sometimes have to look harder for strangeness. Thus, …

Tools (as AI gets more sophisticated you may wind up needing AI to tell real photos from AI generated ones)

Considering my experience (and that people in general might be doing at best C- level work on what amounts to a True-False test), we might all need some help. Here's the Catch-22 we find ourselves in:

1. AI is getting so good that it's hard for humans to tell AI generated content from real,
2. So we may need AI to help us solve the problem.

Here are a few tools for that purpose:

- AI or Not
- Fake Image Detector

  This tool is directed more at images that have been altered using tools like Photoshop or GIMP than it is at AI-generated images. For example, when I gave it an image that I know was generated by AI (the image of Queen Victoria and George Washington shaking hands that I generated as the illustration for this program), it found no problems with it. On the other hand, it was able to identify real images that had been enhanced using software.

- Hive Moderation's AI-Generated Content Detection tools

  Also has tools for detecting AI-produced text and audio

- Maybe's AI Art Detector

  This is somewhat older technology and doesn't do as well at spotting more sophisticated modern fakes.

- TrueMedia.org

  Specializes in detecting fake images in politics

A limitation of these systems is that they get trained on images from specific generators and might not do as well at recognizing fake images from other generators, so using multiple tools to test a given image can be a good idea.

Articles

These were some of the articles I found useful. They also have information and links that didn't make it into today's program.

- "How to Tell If a Photo Is an AI-Generated Fake"
  By Meghan Bartels, *Scientific American*, March 31, 2023.
  https://www.scientificamerican.com/article/how-to-tell-if-a-photo-is-an-ai-generated-fake/

- "Spotting AI: Knowing How to Recognise Real vs AI Images"
  Britannica for Education, March 18, 2024
  https://elearn.eb.com/real-vs-ai-images/

- "Watch the (Verified) Birdie, or New Ways to Recognize Fakes"
  By Stan Kaminsky, *Kaspersky Daily [Blog]*, April 9, 2024
  https://usa.kaspersky.com/blog/real-or-fake-image-analysis-and-provenance/29968/

  Has a section on the C2PA standard which is beyond the scope of today's session but might eventually provide good, verified evidence of the origins and editing history of images.

- "Can You Spot AI-Generated Images? Take Our Quiz to Test Your Skills"
  By Chandra Steele, *PCMag*, Updated June 18, 2024
  https://www.pcmag.com/articles/how-to-detect-ai-created-images