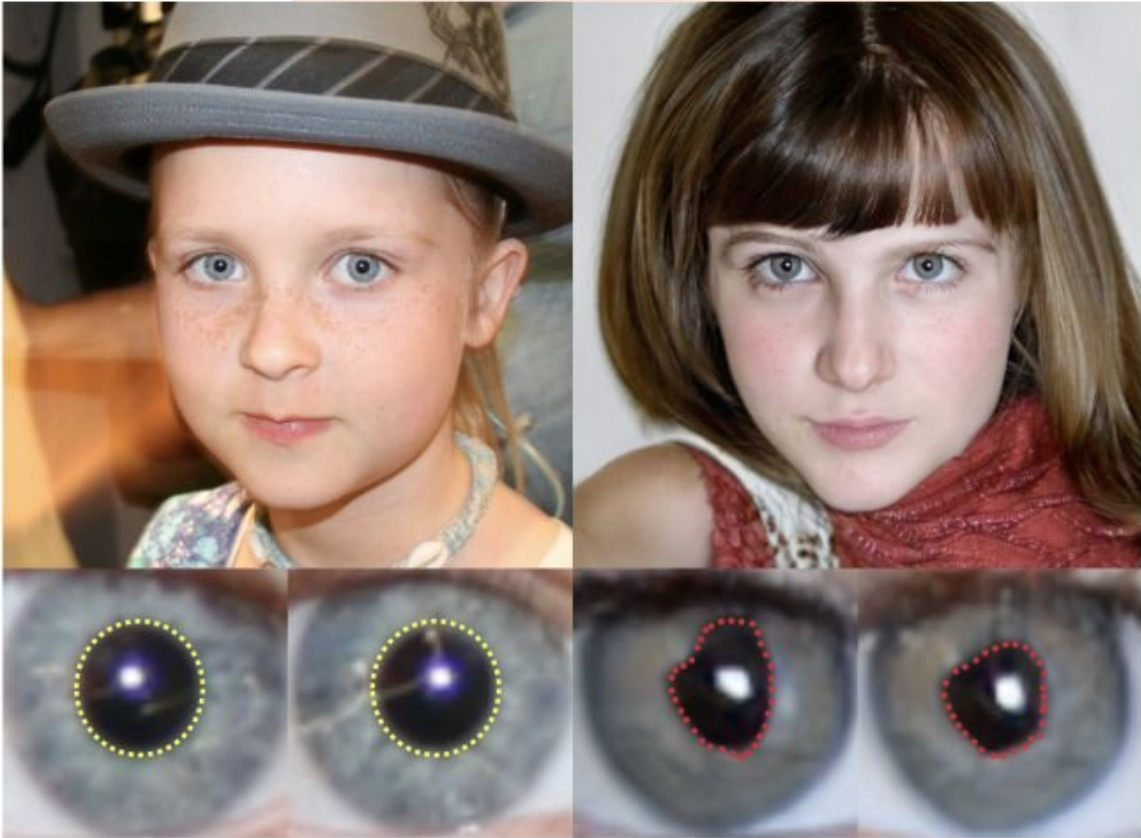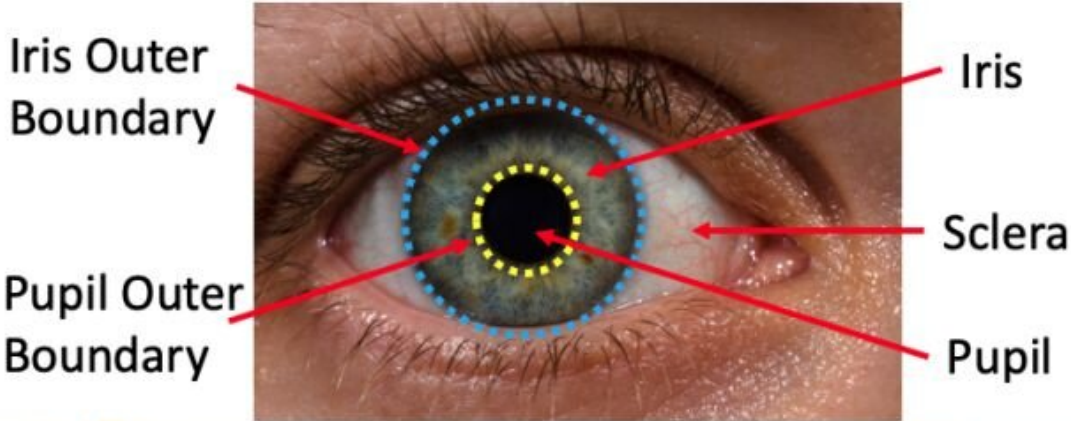# A way to spot computer-generated faces

September 10 2021, by Bob Yirka

Anatomy structures of a human eye. Bottom: Examples of pupils of real human (left) and GAN-generated (right). Note that the pupils for the real eyes have a strong circular or elliptical shapes (yellow) while those for the GANgenerated pupils are with irregular shapes (red). And also the shapes of both pupils are very different from each other in the GAN-generated face image. Credit: arXiv:2109.00162v1 [cs.CV]

A small team of researchers from The State University of New York at Albany, the State University of New York at Buffalo and Keya Medical has found a common flaw in computer-generated faces by which they can be identified. The group has written a paper describing their findings and have uploaded them to the arXiv preprint server.

Over the past couple of years, deepfake pictures and videos have been in the news as amateurs and professional editors alike have created images and videos that depict people doing things that they never actually did. Less reported but related is the increased use of computer-generated images of people that look human but who have never actually existed. Such images are created using generative adversary networks (GANs), and they have reportedly begun showing up on fake social media user profiles, which allows for catfishing and other types of nefarious activity.

GANs are a form of deep-learning technology—a neural network is trained on images to learn what human heads and faces look like. Then they can generate new faces from scratch. The output can be thought of as the average look of all the people that the network studied. The generated face is then sent to another neural network that tries to determine if it is real or fake. Those deemed as fake are sent back for revision. This process continues for several iterations, with the resulting images growing ever closer realism. At some point, they are deemed

finished. But such processing is not perfect, of course, as the researchers with this new effort report. Using software they wrote, they found that many GANs tend to create less-than-round pupils, which, they note, can be used as a marker of computer-generated faces.

The researchers note that in many cases, users can simply zoom in on the eyes of a person they suspect may not be real to spot the pupil irregularities. They also note that it would not be difficult to write software to spot such errors and for social media sites to use it to remove such content. Unfortunately, they also note that now that such irregularities have been identified, the people creating the fake pictures can simply add a feature to ensure the roundness of pupils.

 More information: Hui Guo et al, Eyes Tell All: Irregular Pupil Shapes Reveal GAN-generated Faces, arXiv:2109.00162v1 [cs.CV] arxiv.org/abs/2109.00162

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