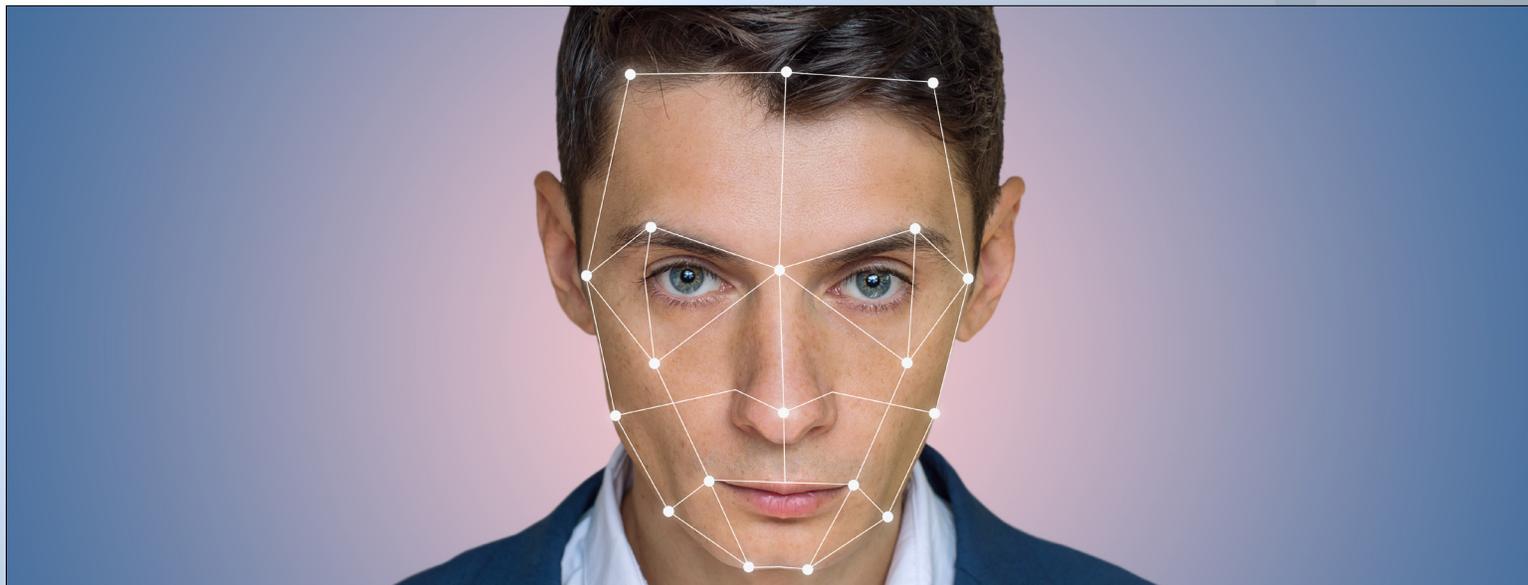


Anti Facial Recognition



Facial recognition software compares measurements and landmarks with images in an existing database to make a match. *(Image courtesy of Adobe Stock)*

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Overview

Facial recognition is a common biometric modality used by military and law enforcement for homeland security and border patrol. The technology; however, is increasingly utilized by the commercial sector, airports, social media sites and cities. [1,2] Facebook's facial recognition algorithm, for example, can identify a person in an uploaded photo with 98 percent accuracy. [3]

Typically, facial recognition software identifies facial landmarks and characteristics, such as the nose and cheekbones, and a computer algorithm measures certain features such as nose width and distance between the eyes. [4] The facial recognition software then compares the measurements and landmarks with images in an existing database to make a match. [4]

Researchers are responding by developing clothing and accessories that thwart the software's recognition capabilities.

Glasses and Makeup

Several companies are developing accessories that block cameras from capturing facial images, thereby preventing the image from being matched to a database of images.

- Reflectacles are anti-facial recognition sunglasses that reflect visible and infrared light, shielding a person's face from surveillance cameras or other imaging technologies. [5]

- A Japanese company developed a privacy visor capable of scrambling the facial recognition software. [6] "Instead of blocking all light, the mesh screen blurs the light that normally reflects on your face, confusing digital facial recognition software that uses unique shadow arrangements to make identifications." [6]

Carnegie Mellon University researchers also sought answers on how to fool facial recognition software. [7] Using large-rimmed glasses, the researchers covered "about 6.5 [percent] of the pixels in any given facial picture. Printing a pattern over those frames then had the effect of manipulating the image." [7] The researchers' glasses tricked commercial facial recognition software and prevented it from identifying the wearer. [7]

In addition to glasses, researchers have looked at thwarting facial recognition technology through makeup. During World War I, the Navy attempted to conceal a battleship's orientation and size by "break[ing] apart [its] visual continuity." [8] One company is using that same theory and avant-garde hair and makeup styles to prevent facial recognition algorithms from capturing key features of the face. [8]

Clothing and Accessories

At least one artist believes certain fabric patterns can confuse facial recognition software, making identification difficult. Described as "a new kind of camouflage," the fabric appears to show multiple faces. [9] Theoretically, the fabric will "overload an algorithm with what it wants, oversaturating an area with faces to divert the gaze of the computer." [10]

Other clothing designers incorporate "anti-flash technology" such as prismatic metallic ink and reflective threads that reflect light, obscuring the wearer's face from photos. [11,12]

Students at New York University's Interactive Telecommunications Program developed Unidentified Halo, a baseball cap fitted with electronics that "shine infrared light onto the wearer's face, invisible to the naked eye but making the face an illuminated blur when seen through an infrared camera." [13]

Homeland Defense Application

Research to counter these technologies is ongoing, as people develop anti-recognition capabilities. Facial recognition will likely remain an important biometric surveillance technology. Airports in the United States have implemented facial recognition software to detect travelers using fake passports, [14] while Australia plans to automate traveler processing using biometric recognition technologies. [15]

New York City plans to track people entering the city using advanced facial recognition technology. [16] "At each crossing, and at structurally sensitive points on bridges and tunnels, advanced cameras and sensors will be installed to read license plates and test emerging facial recognition software and equipment." [17]

Using facial recognition technology is not new in New York. The New York Police Department began using facial recognition software in 2011, comparing surveillance photos to existing criminal databases and social media sites. [18]

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