LAW & DISORDER / CIVILIZATION & DISCONTENTS

4 seconds of body cam video can reveal a biometric fingerprint, study says

Though the wearer's face is hidden, head and body mounted cameras may not be anonymous.

by **Megan Geuss** - Dec 15, 2014 7:55pm EST

39

Any camera will do, as long as it's attached to your body.
Marek Ziolkowski

Researchers say they can have computers examine body camera video footage and accurately identify a person wearing a body-mounted device in about four seconds, according to a recently released paper. The authors of the study had their software look at biometric characteristics like height, stride length, and walking speed to find the identity of the person shooting the footage. As they point out, this could have both positive and negative implications for civilians, law enforcement, and military personnel if they're using body-mounted cameras. (It's important to note that this research paper, *Egocentric Video Biometrics*, was posted to the arXiv repository. As such, it's not considered a final, peer-reviewed work.)

Using static, mounted cameras to match a person's height and gait is a relatively common and well-researched vector for narrowing down the identity of people caught in videos. The authors said that, to get an accurate read of the biometric data of the person wearing the body cam, the footage has to be from a camera secured to one point on a person's body (handheld cameras don't work), and it has to have at least four seconds of video of the camera-wearer walking. Despite these restrictions, the two researchers from The Hebrew University in Jerusalem noted that once the necessary information had been gathered, "the identity of the user can be determined quite reliably from a few seconds of video."

"This is like a fingerprint," Shmuel Peleg, one of the paper's authors, told The Verge. "In order to find the person you have to have their fingerprint beforehand. But we can compare two people and say whether two videos were shot by the same person or not."

To make the identification, the researchers trained an algorithm using Convolutional Neural Networks (CNN), a method of deep learning that looks at layers of an image starting with small pieces and moving up to larger sections of the image. With this, the authors searched for "optical flow" within the video footage and matched it with other sources of body cam footage. (Using CNN to analyze the contents of an image is not unique to academia—Yahoo recently sat down with Ars to discuss its work with CNN to sort through images on Flickr and analyze them according to the weather depicted.)

The researchers noted that the bouncy and unsteady motion usually indicative of a body camera was actually a boon to more accurate identification. That said, even stabilization of the video image didn't harm the results too much—"stabilization degrades CNN performance only slightly (two percent)," the authors of the paper wrote. Still, "Various 3D stabilization schemes are more complex and can possibly remove more biometric information. This investigation is left for future work."

This type of research implies that in the near future, body camera footage posted online could be much less anonymous than its uploader might have hoped. "Police forces released footage of officer activity, and commando operations recorded by cameras on soldiers' heads are widely published on YouTube," the authors wrote. "Some users have even recorded and published what appears to be their own crimes. A consequence of our work is that privacy of such videos is compromised in many cases."

In the wake of Ferguson, where protests erupted after an 18-year-old unarmed black teenager was shot by police, many have called for body cameras to be mandatory for on-duty police officers. Still, few municipalities have set rules governing the use of body cams and the footage taken with them.

PROMOTED COMMENTS

Shavano | Ars Praetorian   jump to post

Interesting, as far as it goes. But it looks like the experiment is much too small to qualify it as being like a fingerprint. They were able to pick an individual out of a set of 34 individuals. With a larger data set, there would presumably be some collision rate where two or more people were not distinguishable by this method and there's not enough data to quantify that collision rate.

Also, fingerprints are stable over time. It is not known whether the characteristics they used to build their model (other than height) remain stable over time -- or a change of shoes.

4733 posts | registered Oct 6, 2012

READER COMMENTS ◄ 39

Megan Geuss / Megan is a staff editor at Ars Technica. She writes breaking news and has a background in fact-checking and research.
@MeganGeuss on Twitter

← OLDER STORY   NEWER STORY →

YOU MAY ALSO LIKE ◢

Indian ISP's routing hiccup briefly takes Google down worldwide