Clearview Search Tips

Potential Causes of Reduced Accuracy for Clearview Facial Recognition Technology

Clearview is an investigative software application that uses state-of-the-art facial- recognition technology to match a face in a user-uploaded image to a face in publicly available images. It is designed to be used in ways that ultimately reduce crime, fraud, and risk in order to make communities safer. Clearview's technology is designed with the utmost attention to accurate and unbiased match-generation.

The following factors can inhibit facial recognition technology from making accurate facial matches. All of these factors concern characteristics of the image that is input by the user (the "probe image") and in some way obscure or disrupt algorithmic analysis of the features of the person the user is attempting to identify (the "search subject"). Searches which are affected by one or more of these factors are more likely to result in search results which do not facilitate accurate identification of image subjects, although accurate results are still sometimes possible when searching images that are affected by these factors. The human operators of Clearview's search technology must follow Clearview's user guidelines and use their law enforcement training to determine the accuracy of all search results.

The most common confounding factors include:

1) Low-Resolution Probe Images

Probe images must have sufficiently high resolution in the facial area of the search subject to allow the facial recognition algorithm to identify and match specific features. Low resolution images, with high pixelation in the face region of the subject, cannot consistently support accurate facial matching. Low resolution probe images may result from the inherent limitations on the resolution of the

camera which took the source image, motion blur, or may result from other conditions such as the distance between the search subject and the camera which took the probe image.

2) Image and Video “Noise” in Probe Image

Just as inherent low resolution can prevent inaccurate matches, “noisy” imagery containing motion blurs and atmospheric interference will result in pixelated and/or blurred facial features for the search subject which frustrates the operation of the facial feature identification and matching algorithm.

3) Poor Lighting Conditions in Probe Images

The facial area of the search subject must be sufficiently well-lit in the probe image to allow the facial recognition algorithm to identify and match specific features. Probe images which do not contain a sufficiently well-lit facial area will not produce accurate search results because the facial features are not sufficiently visible for algorithmic identification.

4) High Camera Pitch Angle Probe Images

Many cameras, such as roof and ceiling-mounted security cameras, and cameras on airborne platforms, produce images which look down on the search subject from a high “pitch”, or transverse, angle. When used as a probe images, cameras that are at a high pitch/transverse angle to the search subject’s face will produce accurate matches at significantly lower rates, because many facial features are not visible from a high transverse angle, and because transposing features to match them with photos taken at a low transverse angle is difficult to accomplish algorithmically.

5) Monitor Screen Artifacts in Probe Images

Some users display an image of the search subject on an LCD monitor and then take a photo of that image with their mobile device, using this photo as the probe image in a search in the mobile app version of Clearview. This often results in artifacts, including visible resolution cells, in the probe image, which prevents accurate algorithmic detection and matching of facial features. To prevent this problem, users should not resort to the “photo of a screen” technique, and should

instead directly upload images from their computers to the web browser version of Clearview.

6) Ancillary/Background Features in Probe Image

Probe images that contain conspicuous background objects and patterns that overlap with the facial area of the search subject can result in inaccuracies in the search results returned by Clearview. This problem can be mitigated in some cases by cropping background objects out of the image.

7) Hats, Glasses and Other Face-Covering Objects

Objects, most commonly items of clothing like hats or sunglasses, which partially or totally obscure the face of the search subject will reduce the likelihood of an accurate match.

Users searching images that are affected by one or more of these factors should exercise additional scrutiny and caution when analyzing the search results, and should expect lower rates of successful identification when using probe images that are characterized by one or more of these factors.