

Case Report

Use of a Photograph from a Deactivated Facebook Account to Identify Fingerprints

Nova Grilli

*Charleston Police Department
Charleston, SC*

Abstract: Three years after a homicide occurred, information about the murder weapon was discovered during court preparation. A search warrant for a Facebook account resulted in the identification of the defendant through an image of a hand holding a firearm that was the same make, model, and caliber as the murder weapon. Confirmation through the Integrated Ballistics Identification System and a comparison by a trained examiner revealed the firearm to be the murder weapon. The identification from the image, along with other evidence in the case, resulted in the defendant pleading guilty.

Introduction

Technological innovations, such as cell phones and social media, have resulted in an increase of information sharing on public forums. Because of the improvements in image capturing with cell phones, people use these devices in lieu of actual cameras to post pictures on social media sites at an unprecedented rate. A study by Oxford University documents the increase in social media usage, stating in 2018:

... there are 7.7 billion people in the world, with at least 3.5 billion of us online. This means social media platforms are used by one-in-three people in the world, and more than two-thirds of all internet users. [1]

In 2018, among all social media platforms, Facebook was the most used site listed, with 2.3 billion users [1]. For some, there is no apprehension about sharing information on social media

Received April 8, 2020; accepted May 20, 2020

Journal of Forensic Identification
70 (4), 2020 \ 407

sites. This is evident in multiple cases in which social media, specifically Facebook, has been used to apprehend perpetrators. For example, in 2012, a friend of a murder suspect allowed investigators to view relevant information through his Facebook account [2]. This case took place in the early stages of social media platforms, introducing the question of Fourth Amendment rights, which protect a person's home and belongings against unreasonable searches and seizures [2]. The suspect's attorney claimed his client's Fourth Amendment right was violated. The judge ruled that because the attorney's client posted the pictures online with the intent to share with friends, he forfeited his expectation of privacy [2]. Another case occurred in 2015 when a man was arrested on robbery charges after posting pictures of large amounts of money on Facebook [3]. Lastly, a homicide case investigated by my department discovered a Facebook image of the suspected murder weapon, which presented additional information to the case.

Investigation

In the fall of 2016, a male victim was shot multiple times outside his home. Nearby witnesses heard gunshots and observed someone, presumably the shooter, driving away from the crime scene. A brief description of the color and type of vehicle was given and through the use of surveillance video, investigators were able to track the vehicle. In one video, the driver exited the vehicle, walked to a parked car, opened the door, reached in, closed the door, and walked away. Investigators responded to the parked car and witnessed a firearm in plain view. A search warrant was obtained for the vehicle; the firearm and other evidence were collected and processed. Subsequently, a suspect was identified from a latent print from an item in the car, but unfortunately, no prints of value were recovered from the firearm.

Although latent print evidence identified the suspect in 2016 and additional evidence linked him to the case, it was not until three years later that information concerning the murder weapon was discovered. During court preparations in 2019, a witness stated her firearm had been stolen before the homicide took place and she believed the defendant was the perpetrator. This stolen firearm was the same make, model, and caliber used in the homicide and possessed a distinctive physical description similar to the stolen firearm. The witness informed investigators that she viewed a picture of the suspected stolen firearm on the Facebook

page belonging to the defendant prior to the homicide. Sometime after, although the date is unknown, the defendant deleted his Facebook account. When investigators were given this information, because of the deactivation of the account, they were unable to view the image. The lead investigator obtained a search warrant for the records of the defendant's Facebook account. From these records, the image in question was retrieved.

Materials and Methods

The original image that was obtained from the downloaded records of the defendant's Facebook account was submitted onto a CD as a jpeg file. The file was 1154 pixels x 2048 pixels and 96 dpi. The CD was a Staples CD-R 700MB. To ensure the originality of the image on the CD, a hasher software was used (Hasher version 1.8.0.0). The hasher software designates a unique identifier number to each image it hashes, and results are saved as an xml file. The unique identifier numbers are compared between the two excel sheets. The image was hashed while on the CD and hashed again after it was copied to my desktop. The results supported no changes had been made to the original image. The original image was never opened directly from the CD.

The copied image was opened in Adobe Photoshop version CC2015.5. I used the ACE-V methodology (analysis, compare, evaluate, and verification) to conduct the examination. Upon an initial analysis, I observed a pink 9 mm firearm resting on the palm side of a left hand (Figure 1). I magnified the image to ensure friction ridge skin could be observed. Photoshop settings were established to record all adjustments that were performed during latent print examination. These settings included selecting "Metadata" under History Log, along with "Detailed" under Edit Log Items. During the analysis part of the examination, using the *Brush* tool, I labeled each impression that was of value and annotated areas that were not of value. The *Brush* tool was used to write on the image. There were four impressions of value (labeled a, b, c, d) and one impression not of value.

Each image was then inverted to display ridges as black and furrows as white. The Red Channel was selected and the image was flipped horizontally to ensure ridges were flowing in the same direction as the known prints. Each impression that was documented was cropped and orientated to the correct position. The images were then changed to grayscale and saved as formatted images 103-1a, 103-1b, 103-1c, and 103-1d (Figures 2-5).

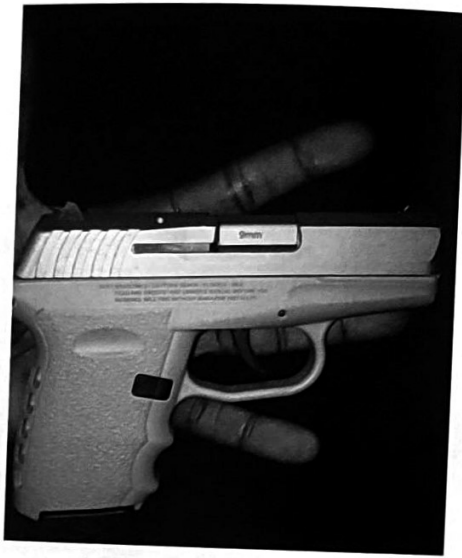


Figure 1
Original image from Facebook warrant.

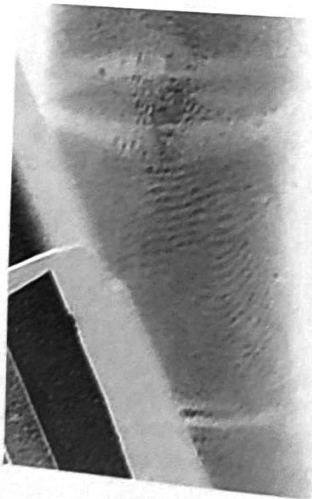


Figure 2
Image 103-1a oriented for comparison.



Figure 3
Image 103-1b oriented for comparison.

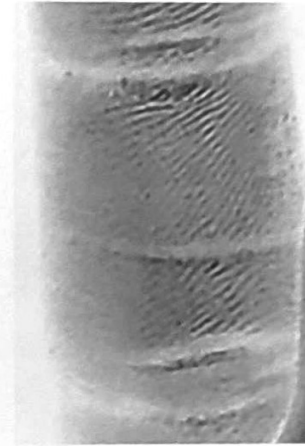


Figure 4
Image 103-1c oriented for comparison.



Figure 5
Image 103-1d oriented for comparison.

Because of a previous arrest, the defendant's rolled fingerprints and palmprints were retained in the local automated fingerprint identification system database. The left palmprint card was scanned using an Epson Perfection V800 scanner at 500 ppi. Latent 103-1a and the left palmprint card were then opened in Photoshop, placed side by side, and were adjusted in size until they appeared to be equally magnified. A screenshot was created to make one image from the two separate images. Comparisons in Photoshop were then conducted marking Level 2 detail using the *Brush* tool. This was done for each latent. The marked screenshots were saved, as well as blank screenshots without my markings or conclusion.

Results and Discussion

My conclusions from the comparisons resulted in identifications to each impression of value. Latent 103-1a was identified to the defendant's left index proximal phalange (Figure 6); 103-1b was identified to the left index distal phalange (Figure 7); 103-1c was identified to the left little medial phalange (Figure 8); and 103-1d was identified to the left little distal phalange (Figure 9). My agency has defined identification as sufficient clarity and quantity of agreement between the latent and known that the likelihood of the latent made by another source is highly unlikely. All identifications were verified by a trained and competent examiner.

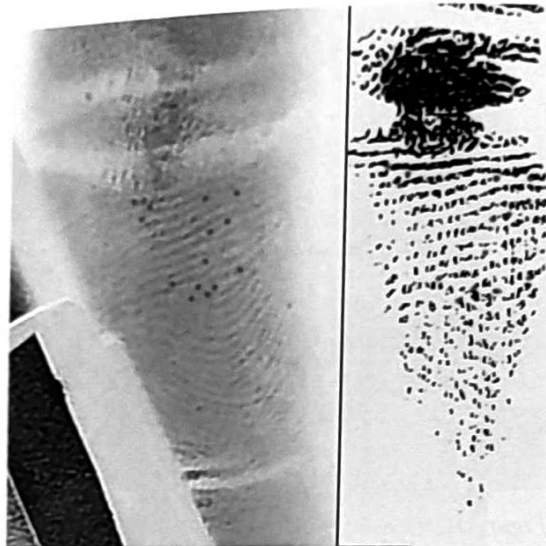


Figure 6

Screenshot of the identification of image 103-1a and the left index proximal phalange.

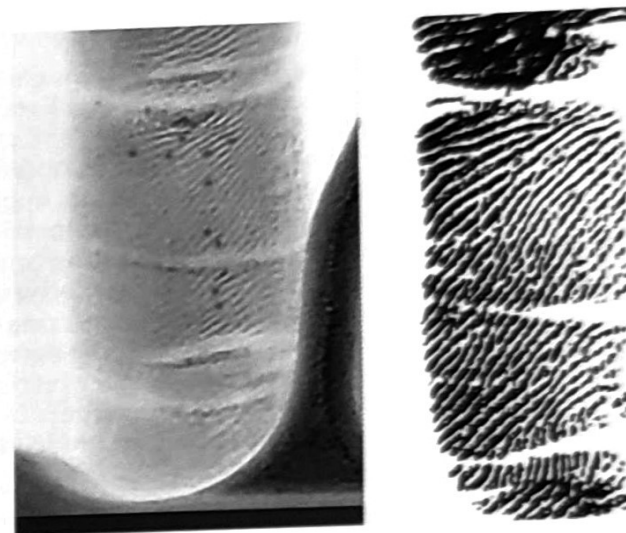


Figure 8

Screenshot of the identification of 103-1c and the left little medial phalange.



Figure 7

Screenshot of the identification of 103-1b and the left index distal phalange.

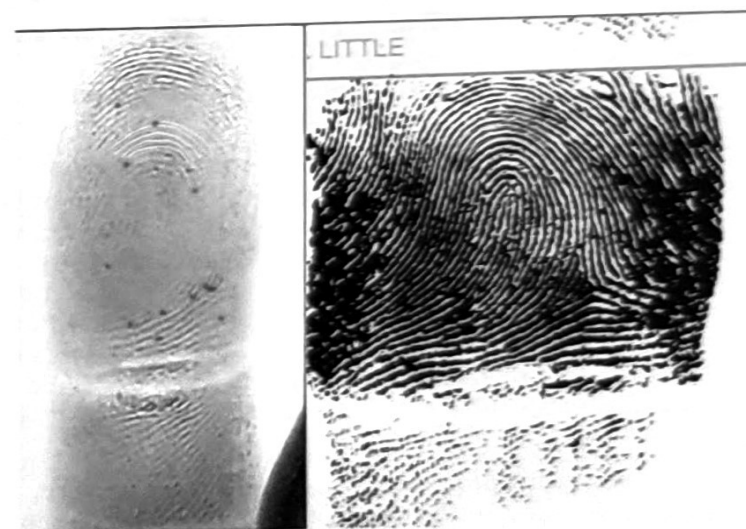


Figure 9

Screenshot of the identification of 103-1d and the left little distal phalange.

Latent print testimony was given, albeit to previously identified latent print evidence collected from inside the vehicle in which the firearm was discovered. Testimony on the Facebook image was dependent on the direction of the defense and consequently, I did not testify to the image. It should be noted that the firearm was identified as the murder weapon through the Integrated Ballistics Identification System. In this particular case, a trained examiner concluded the unique markings on each cartridge came from the suspected firearm. Additionally, it was discovered that the victim had been a confidential informant for the department and was expected to testify against the defendant days after his death. After the witness and expert testimony concluded, the defendant pleaded guilty on all charges, including a lesser charge of voluntary manslaughter, and received 25 years.

Limitations

It is evident that with the popularity of social media sites, it is possible to use these platforms as a means for latent print examinations. One must consider a company's policy on releasing information regarding a client's account. In a 2012 article by Heather Kelly, some sites, such as Twitter, have more stringent requirements for releasing information [2]. Policies may have changed since 2012, but understanding how each social media platform handles these requests from law enforcement is important.

Another factor to take into consideration is the type of cell phone that was used to capture images. In a 2020 article by Cameron Forsyth, the resolution of cell phone cameras was also cited as a possible limitation [4]. For example, in a case processed by a neighboring department of Charleston Police Department (CPD), an image was exported directly from a cell phone and submitted to CPD. Unfortunately, the image had too low of a resolution and was not of value.

Lastly, some agencies struggle to obtain funding for equipment and software. Proper computer equipment, software, and training to proficiency in the use of the software are essential to provide accurate conclusions. When working with digital evidence, it is important to provide assurance that no alterations of the image have been made prior to obtaining the image from the media device. As previously stated, Photoshop provided the functionality to calibrate, format, analyze, document conclusions, and keep a record of all adjustments.

Conclusions

The purpose of this case study is to bring awareness to investigations and analysts of situations provided by the increased use of social media platforms. The success of a search warrant from a deactivated Facebook account provided the ability to show an adequate image of friction ridge skin. With the use of Photoshop, the image was enhanced and a comparison was conducted that resulted in an identification to the defendant on trial. This case study was the first time the agency and I were able to successfully obtain visible fingerprints from an image directly from a social media platform.

Acknowledgments

I would like to thank the lead investigator, Sgt. Tuttle, for providing details that presented the backstory of this case. Thank you to Cpt. Weiss for his role in the case. Also, thanks to the Digital Evidence Supervisor, Jerry Roberts, for his expertise in digital evidence.

For further information, please contact:

Nova Grilli
Charleston Police Department
180 Lockwood Blvd.
Charleston, SC 29403
grillin@charleston-sc.gov

References

1. Ortiz-Ospina, E. The Rise of Social Media. *Our World in Data* website, ourworldindata.org/rise-of-social-media, posted 18 September 2019 (accessed February 2020).
2. Kelly, H. Police Embrace Social Media as Crime-fighting Tool. *CNN Business* website, cnn.com/2012/08/30/tech/social-media/fighting-crime-social-media/index.html, posted 20 August 2012 (accessed February 28, 2020).
3. Ferrigno, L. Authorities: Man Robs Bank, Posts Pics to Facebook Playing with Wads of Cash. *CNN* website, cnn.com/2015/09/29/us/ohio-bank-robbery-facebook-cash/index.html, posted 29 September 2015 (accessed February 28, 2020).
4. Forsyth, C. Fingerprint Identifications from Explicit Photographs Lead to Pedophile Convictions. *J. For. Ident.* 2020, 70 (1), 17-22.