Journal of Forensic Sciences And Criminal Investigation
ISSN: 2476-1311

Juniper Publishers key to the Researchers

Commentary
Volume-3 Issue -2 May 2017
DOI: 10.19080/JFSCI.2017.03.555607

J Forensic Sci & Criminal Inves

The Use of Colored Barrier Filters to Enhance Impression Evidence

***Andrew R Reitnauer**

Delta Forensics, LLC, USA

Submission: April 29, 2017; **Published:** May 04, 2017

***Corresponding author:** Andrew R Reitnauer, MSFE, CLPE, CSCSA, Delta Forensics, LLC, USA, Email: andrew @delta-forensics.com

Abstract

Colored barrier filters are used commonplace in the forensic laboratory under an alternate light source as a means of visualizing fluorescence when examining evidence. One of the primary goals when processing evidence for impressions, such as latent prints, footwear, and biological stains is to capture the impression with the optimal contrast to the background. This allows the examiner to clearly disseminate between the background noise and the characteristics of the impression. One method of achieving this goal is the utilization of colored barrier filters to assist the examiners in reducing the background of an impression.

Introduction

In the forensic laboratory, scientists are tasked with the examination of evidentiary items for a variety of purposes. Crime Scene Personnel and Forensic Examiners are tasked with enhancing photographs of questioned impressions in order for an analysis and comparison to be conducted to a known exemplar. The primary goal of the scientist taking the photograph shall be the optimal contrast between the background surface and the questioned impression [1]. If the examiner has the ability to optimize this contrast, it may allow for a clear visualization of the impression and the ability to discern the minute details present during the comparative process. One method that is available, both at a crime scene and within the confines of the controlled laboratory environment, is the use of barrier filters.

Often, questioned impressions may be discovered or developed on a surface containing multiple colors or hues that can mask some of the details present in the impression. The forensic examiner must be able to use their knowledge and equipment to best capture the impression for critical comparison purposes. One way this can be achieved is through physical lifting mechanisms, where the impression is removed from the surface area, thus eliminating any distortional concerns from the background. However, this may not always be achieved due to the type of surface or the requirement for additional examination methods. In these instances, the examiner must be able to capture the best image possible, and that may involve the considerations for subsequent digital enhancement techniques.

Within the comparative disciplines, there is often software present that has the ability to enhance digital images, in order to improve contrast, assist the examiner with clarity, and remove some embedded color tones. While there are many different software platforms and techniques that can be utilized, the overall tonal values will have an effect on the resulting working image [2]. In considering the abilities of the digital imaging software available, examiners can utilize different techniques to best visualize and capture the impression evidence. The addition of a colored barrier filter that is present in the background surface, allows an overall hue to be cast over the entire subject matter of the photograph, which can be the primary focus of the subsequent digital imaging enhancement efforts [3]. By introducing a filter, and using a technique, such as a channel in Adobe Photoshop, the examiner can enhance the image by removing all of the color tones introduced into the image during capture. The resulting image may help eliminate the background noise or artifacts, leaving a more optimal impression for examination.

In the figures below, a few examples of how filters may assist with the visualization of impressions are listed. In each example, the introduction of a color, similar to the darkest color value that is the focus of the enhancement efforts has been used (Figure 1).

In this example, a latent print was deposited onto a fire extinguisher [4]. The overlap of the impression between the white and red areas, allows for the darker red to obscure some

of the details that may be present. The top line shows the photograph as taken under ambient room lighting, without a filter, along with a basic enhancement of red channel/grayscale/auto levels in Adobe Photoshop [5]. The images on the second line show the same impression, however a red filter was placed on the camera and photographed. Using the same enhancement techniques, the resulting image shows the presence of additional ridge detail in the red area (Figure 2).

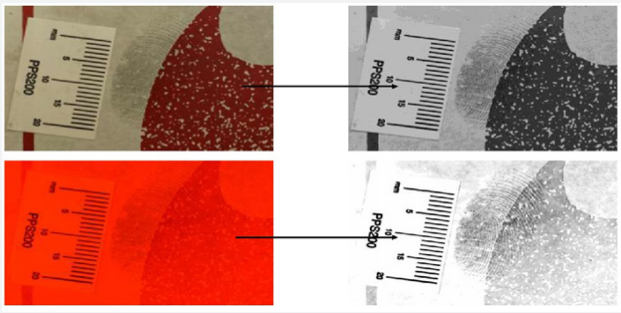

Figure 1: Latent print was deposited onto a fire extinguisher.

Figure 2 shows some writing on a window in a red-colored marker. By utilizing a red filter, the color of the writing has been absorbed by the filter, and by again using the red channel/grayscale/auto levels, the presence of the writing has been lessened, as shown in the enhanced images below. The image on the left is using ambient lighting, the image on the right has a red filter on the camera (Figure 3).

Figure 2: Some writing on a window in a red-colored marker.

Figure 3: Dust shoewear impression on a paper towel that has some handwriting present in blue ink.

Figure 3 depicts a dust shoe wear impression on a paper towel that has some handwriting present in blue ink. In this example a blue filter was utilized to enhance the impression, as the target goal for the enhancement is the reduction of noise and distortion caused by the blue pen. The top image shows the original image under ambient lighting, the bottom left image using the blue filter, and the bottom right image shows the enhancement in Adobe Photoshop using the blue channel/grayscale/auto levels.

Conclusion

The use of a colored barrier filter can assist the forensic examiner in capturing an optimal impression beyond the conventional usage in the fluorescent examination of evidence and reagents [6]. Both crime scene responders and laboratory examiners can utilize filters as a method to enhance impressions and remove unwanted backgrounds [7]. Examiners must also be cognizant of the desired result, or focus of the photograph, and the possible digital imaging enhancement techniques available that may assist their examination process. By understanding the overall color tones of the subject matter, the recognition of the surface area, and the intended work product of the photograph, the examiners may optimize their efforts in using the best contrast image for the comparative process.

References

1. Dalrymple, Brian (2012) Adapting Narrow Bandpass Filters to Photography. J of For Ident 62(3).
2. Holder, Eric Himpton, Laurie O Robinson, John H Laub (2011) The Fingerprint Sourcebook. Washington, DC.
3. Pascua, Corazon S, Memel, E Roland (1999) Fluorescence Detection of Latent Fingerprints: Direct Entry to AFIS. J of For Ident 49(1).
4. Ramotowski, Robert S Lee, Gaensslen (2012) Advances in Fingerprint Technology. (3rd edn.), CRC Press.
5. Robinson, Edward M (2010) Crime Scene Photography. (2nd Edn.) Academic Press.
6. Hirsch, Robert (2013) Exploring Color Photography: From Film to Pixels. (5th Edn.) Taylor and Francis.
7. Lahm, Cathryn, Reitnauer, Andrew (2015) The Use of Colored Barrier Filters in Forensic Photography. Fingerprint Whorld 62(158).

How to cite this article: ndrew R R. The Use of Colored Barrier Filters to Enhance Impression Evidence. J Forensic Sci & Criminal Inves. 2017; 3(2): 555607. DOI: 10.19080/JFSCI.2017.03.555607.

DOI: 10.19080/JFSCI.2017.03.555607

How to cite this article: Andrew R R. The Use of Colored Barrier Filters to Enhance Impression Evidence. J Forensic Sci & Criminal Inves. 2017; 3(2): 555607. DOI: 10.19080/JFSCI.2017.03.555607.