



B128 Blood on Black Using Polarized Light to Enhance Bloodstains on Dark, Dielectric Surfaces

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The goal of this presentation is to introduce an improved method of photographing dark, bloodstained substrates without the use of chemical enhancement techniques, specialized film needs or digital imaging operations.

Accurately visualizing and documenting bloodstains and patterns are an integral part of crime scene processing and provides crucial information for both the analysis of evidence in the laboratory and crime scene reconstruction efforts.

During the course of examining evidence in cases, we have done some exploratory work using polarizing filters over the light source and the camera lens. We have observed stunningly dramatic improvement in the contrast between the otherwise subtle bloodstains and the dark or black background. This presentation will impact the forensic science community by introducing results from NIJ funded research into

identifying the optimum conditions and limits for this polarized light photographic method.

Accurately visualizing and documenting bloodstains and patterns is an integral part of crime scene processing and can provide crucial information for both the analysis of evidence in the laboratory and crime scene reconstruction efforts.

Visualization of bloodstains is trivial for bloodstains on white or lightly colored surfaces. However, on darkly colored or black surfaces, this visualization can be extremely difficult. The failure to visualize and thereby recognize blood and bloodstain patterns on darkly colored surfaces has had seriously adverse consequences for important criminal investigations.

There are two aspects to the problem. First, the presence of blood may not be recognized at critical stages in the investigation. Second, where the presence of blood is recognized, the pattern of blood-staining may not be appreciated. Sampling of bloodstains for DNA typing and other analyses must take place with knowledge of the bloodstain patterns. Otherwise important information may be destroyed. In a significant number of cases knowing how the bloodstains were formed is more important than knowing the biological source of the stains. In most cases the two types of information are complementary.

Photography represents a nondestructive method of documenting stains. Traditionally, black and white photography uses color filters to either lighten or darken a stain against the surrounding background to elucidate the forensic information contained on a difficult substrate. This technique, however, provides little benefit with bloodstains on very dark and reflective surfaces. Observing and documenting bloodstains on these surfaces is problematic due to the glare reflected off of the surface as well as the lack of contrast between the stain and substrate.

Previous studies have shown the usefulness of chemical enhancement techniques on bloodstain patterns, with the drawback of potentially compromising DNA analysis and altering the stains. Performing background corrections on digital images and the combination of digital photographs taken at two or three wavelengths have also been shown to lead to enhanced visualization of blood on some strong colored substrates.

During the course of examining evidence in cases, some exploratory work using polarizing filters over the light source and the camera lens has been done. There has been an observed stunningly dramatic improvement in the contrast between the otherwise subtle bloodstains and the dark or black background.

This presentation will introduce results from NIJ funded research into identifying the optimum conditions and limits for this polarized light photographic method.

Polarized Light, Bloodstain Visualization, Photography