



Criminalistics Section – 2010

A37 Estimating Area of Origin Through the Use of Void Patterns and Shadows

Zerah M. Malone, MS*, 5102 Galley Road, #443AW, Colorado Springs, CO 80915; and April Allgood, MS*, University of Colorado at Colorado Springs, 1420 Austin Bluffs Parkway, Colorado Springs, CO 80918

After attending this presentation, attendees will understand the basic method for determining the area of origin through the use of the Void Pattern Shadow Matching method (VPSM).

This presentation will impact the forensic science community by discussing how matching provides a quick and accurate alternative which can be used when an immediate estimate is needed. Since VPSM requires no equipment other than a flashlight, it would be easily accessible to everyone. VPSM requires no contact with evidence and can therefore be used without compromising the integrity of the scene. Finally, since it requires fewer measurements than any other method in use, the potential for human error is reduced.

The presentation of this material will describe the basic method for determining the area of origin of a spatter pattern in a bloodletting event through use of the Void Pattern Shadow Matching method. Results obtained through the method will be compared to results of the Stringing and Backtrack methods to determine relative accuracy. The research hypothesizes that it is possible, if a void pattern is present and the object that created it is still in its original position, to estimate the area of origin by duplicating the void with a shadow thrown by a controlled, external light source.

It is suggested that the technique used in this research be termed "Void Pattern Shadow Matching (VPSM)". For VPSM to be utilized a void pattern must be present and the object which created it must still be in its original position. A light must then be directed at the object and adjusted until the shadow it creates exactly duplicates the void pattern behind it. The position of the light source will represent the area of origin. VPSM shows the best results when two void patterns are matched simultaneously using shadows cast from an LED flashlight with a one-inch lens.

Researchers conducted an experiment in which blood spatter was generated from a sponge set on a cinder block 27.75 inches from the target area and 34 inches above the floor. The target area consisted of a set of shelves holding various household objects with a backing of white poster board. The spatter left void patterns which were visible on the poster board backing. Estimations of area of origin were obtained using Backtrack, Stringing, and the Void Pattern Shadow Matching methods, and all results were compared to the known area of origin. Evaluations were then conducted to determine the relative accuracy of the methods.

The VPSM results were three inches above the known area of origin and horizontally exact. The Stringing method gave results that were 3.45 inches lower than the known area of origin and diverged by 2.6 inches from the known point of convergence. Backtrack results showed a deviation of 3.85 inches from the area of origin and 3.7 inches from the point of convergence.

In this experiment, the Void Pattern Shadow Method proved to be the most reliable when compared to the other methods tested. It is concluded that VPSM is an acceptable alternative when circumstances allow for its use.

Blood Spatter, Void Patterns, Light