



F36 Preferred Crime Scene Documentation Methods

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Learning Overview: The goal of this presentation is to provide the forensic science community with data regarding the monetary, temporal, and interpretative advantages or disadvantages of utilizing 3D laser scanners in scene documentation as compared to traditional documentation methods.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing data on how 3D scanned products perform compared to other documentation methods and how much novel data can actually be gleaned from the scans as compared to traditional mapping methods.

Technological advances have allowed for a decrease in the costs associated with 3D laser scans and an increase in the availability of scanners for crime scene investigators. However, the value of this new technology in crime scene documentation as compared to traditional techniques (i.e., hand-drawn maps, photographs) is largely unknown. This presentation will provide the scientific and medicolegal community with quantitative data on a layperson's and a forensic professional's interpretation and assessment of traditional scene documentation and 3D laser-scanned representations of potential crime scenes. This presentation's proposition is that 3D laser-scanned images do not always provide the best information to a jury.

A total of four indoor and eight outdoor mock crime scenes involving human remains, or a proxy, were documented using a 3D laser scanner and multiple traditional means, including photographs, hand-drawn and total station/GIS maps, and detailed notes. The outdoor scenes included human skeletal or mummified remains on the ground surface and in burials established at the Anthropology Research Facility at the University of Tennessee, Knoxville. Following documentation, 200 people were surveyed and asked to review and compare the documentation products. Respondents were required to rank the method that best represents a given crime scene scenario with respect to human remains and associated evidence. As a result, there is quantifiable data regarding the effectiveness of 3D laser-scanned images as compared to traditional documentation images. In addition, this study conducted cost/benefit analysis for all documentation methods, noting the time and expenses (personnel and equipment) associated with each method. This will provide agencies with data in making training and budgetary decisions regarding the acquisition of such instrumentation.

The survey results indicate that while many participants appreciate the detail and clarity provided by 3D scanning, the use of such may not always be the most effective and/or efficient use of an agency's resources. For the current study, examination of the age cohort on respondent answers was analyzed. The age cohorts were grouped by 18–22 years ($n=5$), 23–30 years ($n=12$), 31–45 years ($n=32$), 46–60 years ($n=25$), and 61+ years ($n=51$). Evidence preference was analyzed with a Kruskal-Wallis test in R. Results indicate that respondent age cohort does not impact the preference on site recording media. Overall, there is a preference for 3D renderings, with 80.2% preferring this media for site presentation. Photographs were the second most preferred method, with a 14.9% preference, followed by hand-drawn maps (3.3%), then 2D maps (1.6%). The 18–22 year cohort had a 100% preference for 3D renderings; the 23-30 year cohort was more varied with a 66.7% preference for 3D renderings, 12.7% for 2D maps, and 8.3% for hand-drawn maps and photographs, respectively. The 31-40 year age cohort had a 70.9% preference for 3D renderings, 22.6% for photographs, and 6.5% for hand-drawn maps. The 41-60 year cohort had a 96% preference for 3D renderings and 4% for hand-drawn maps. Last, the 61+ year cohort had a 79.6% preference for 3D renderings and 20.4% for photographs.

3D Scanning, *Voir Dire*, Crime Scene Documentation