Combining Laser Scanning and High Dynamic Range Photography for the Presentation of Bloodstain Pattern Evidence

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Abstract : Bloodstain Pattern Analysis (BPA) forensic evidence can be complex, requiring effective courtroom presentation to ensure clear and comprehensive understanding of the analyst's findings. BPA witness statements can often involve reference to spatial information (such as location of rooms, objects, walls) which, when coupled with classified blood patterns, may illustrate the reconstructed movements of suspects and injured parties. However, it may be difficult to communicate this information through photography alone, despite this remaining the UK's established method for presenting BPA evidence. Through an academic-police partnership between the University of Warwick and West Midlands Police (WMP), an integrated 3D scanning and HDR photography workflow for BPA was developed. Homicide scenes were laser scanned and, after processing, the 3D models were utilised in the BPA peer-review process. The same 3D models were made available for court but were not always utilised. This workflow has improved the ease of presentation for analysts and provided 3D scene models that assist with the investigation. However, the effects of incorporating 3D scene models in judicial processes may need to be studied before they are adopted more widely. 3D models from a simulated crime scene and West Midlands Police cases approved for conference disclosure are presented. We describe how the workflow was developed and integrated into established practices at WMP, including peer-review processes and witness statement delivery in court, and explain the impact the work has had on the Criminal Justice System in the West Midlands.
Keywords : bloodstain pattern analysis, forensic science, criminal justice, 3D scanning
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