D3 VIRTOPSY® – Scientific Documentation, Reconstruction, and Animation in Forensics: Individual and Real 3-D Data Based Geo-Metric Approach Including Optical Body / Object Surface and Radiological CT / MRI Scanning

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After attending this presentation, attendees will learn the newest cutting edge technologies of 3-D documentation in forensic medicine. This presentation will impact the forensic community and/or humanity by demonstrating the possibilities of 3-D techniques in forensic.

Until today, most of the documentation of forensic relevant medical findings is limited to 2-D photography, 2-D conventional radiographs, sketches and verbal description. There are still some limitations of the classic documentation in forensic science especially if a 3-D documentation is necessary. The goal of this paper is to demonstrate new 3-D real data based geo-metric cutting-edge technology approaches. This paper present approaches to a 3-D geo-metric documentation of injuries on the body surface and internal injuries in the living and deceased cases. Using modern imaging methods such as photogrammetry, optical surface and radiological CT / MRI scanning in combination it could be demonstrated that a real, full 3-D data based individual documentation of the body surface and internal structures is possible in a non-invasive and nondestructive manner. Using the data merging / fusing and animation possibilities, it is possible to answer reconstructive questions of the dynamic development of patterned injuries (morphologic imprints) and to evaluate the possibility, that they are matchable or linkable to suspected injurycausing instruments.

For the first time, to the authors' knowledge, the method of optical and radiological 3-D scanning was used to document the forensic relevant injuries of human body in combination with vehicle damages. By this complementary documentation approach, individual forensic real data based analysis and animation were possible linking body injuries to vehicle deformations or damages. These data allows conclusions to be drawn for automobile accident research, optimization of vehicle safety (pedestrian and passenger) and for further development of crash dummies. Real 3-D data based documentation opens a new horizon for scientific reconstruction and animation by bringing added value and a real quality improvement in forensic science.

Virtopsy®, Radiology, 3-D Surface Scanning

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