H66 Photogrammetry Applied to Forensic Pathology: Low-Cost Support to "Freeze the Body in Time"

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After attending this presentation, attendees will understand the usefulness of the photogrammetry technique during an autopsy.

This presentation will impact the forensic science community by providing a recording 3D technique that would also be user-friendly and a valuable support during an autopsy.

The major challenge in every type of forensic investigation, both during the crime scene and in the autopsy phases, is gathering a sufficient amount of information to reconstruct the conditions of a crime scene or a dead body. This can be achieved by the long and difficult work of gathering data that will, objectively, be insufficient to "fix in time" every aspect of the examined situation. Moreover, traditional acquisition methods risk providing information that is too related to the investigator's point of view. The solution lies in freezing, by virtual means, the scene and/or the body in order to obtain a representation that is free of the investigator's influence.

The technologies that are currently available allow this, but they impose a high monetary cost. The method described in this presentation suggests the possibility of achieving such an objective at a very low cost. The only requirements are a digital camera and appropriate computer software. This technique derives from a full photographic report based on photogrammetry.

Photogrammetry is a highly sensitive technique that allows the gathering of the metrical data of an object (shape and position) by acquiring and analyzing stereometric pictures. Several different types of software are capable of this technique. On average, the different programs allow the acquisition of up to 500 pictures of the object (acquired from several points of view) in order to provide a 3D reconstruction of it. Once the pictures are uploaded in the software, they are processed with a method known as Structure From Motion (SFM), which consists of recognizing a point in common between various images using the Scale Invariant Feature Transform (SIFT) algorithm. This allows the creation of a cluster of points characterized by their special positioning in a system of coordinates and intensity scale values (color, depth, etc.), allowing the re-creation of a 3D version of the object.

The original photogrammetry technique was used in architecture and geology to obtain accurate reproductions of the plans of buildings or natural cavities. In time, it was expanded to include the bio-medical field and became indispensable in the creation of anatomical models and the creation of 3D prosthetic devices.

This study introduces the use of the photogrammetry technique to the field of forensics.

Forensic Science, Photogrammetry, Virtual 3D Rendering

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