Msc Bartosz Klepczyński

Dissertation:

3D modeling in forensic science and criminal trial

Summary:

Precise reconstruction of the crime scene and forensic evidence has been and still is one of the foundations of the proving process since the beginning of forensic science as a science. The techniques of registration and reconstruction were already perfected by forensic pioneers such as Alfons Bertilion who described and perfected the technique of metric photography. Hans Gross noticed (“the father of modern forensics”) in the "Handbook for the examining judge as a forensic system" published in 1893 that terrain topography is important element for understanding the crime scene. He devoted a subchapter "on modeling" to this issue in which apart from the essence of the three-dimensionality of the terrain indicated ways to manually present it using plastic models.

Over time, the modeling methodology presented by Gross has evolved. New plastic masses allow for detailed mapping of forensic evidence in the field of traseology, mechanoscopy or odontoscopy. Based on the reconstructions produced in this way it is possible to perform a forensic analysis and give expertise.

The next evolutionary step in modeling for the needs of forensics and the criminal trial is the digital technology. Thanks to its use, non-invasive (non-destructive) registration of microscopic objects as well as large land areas with an accuracy of hundredths of a millimeter is possible.

The dissertation concerns the possibility of forensic use of 3D technology. It describes the possibilities of using photogrammetric 3D reconstruction technology and laser scanning in specific forensic cases such as traffic accidents or air accidents. The dissertation also shows the possibility of 3D technology using in the analysis of forensic traces in the field of odontoscopy, traseology and forensic medicine. The research and conclusions set out in the dissertation were carried out on the basis of the author's use of the above-mentioned technology in criminal cases conducted in the country and abroad (proceedings carried out by the Military Police, the Police, the National Prosecutor's Office). The conducted research made it possible to present in the dissertation not only the possibilities and directions of development of the use of 3D technology in criminal proceedings but most importantly, it indicated the limitations of this technology.