IDENTIFICATION OF PERPETRATORS BASED ON BLOODSTAIN PATTERN ANALYSIS

Piotr Girdwoyn, Tadeusz Tomaszewski,

University of Warsaw

The project aims to combine the advances in imaging technology and 3D data processing techniques to establish a complex system not only to register and document but also to analyze, reconstruct and finally to visualize in 3 D the crime scene with particular focus on bloodstains.

The presented system will be able to preserve the crime scene and generate a 3D model from the digital data that can be used for further analysis with the dedicated software provided with the system. The specialized analytic module for bloodstains will provide forensic experts with an opportunity to perform precise, quick and objective assessment. In addition, the implemented bloodstain database will support the expert in determining the mechanism for generation of the bloodstains at the scene. This solution will be capable of presenting the distribution and layout of stains in an unambiguous, trustworthy and objective way. These are crucial factors to draw the right conclusions about the origin mechanisms of bloodstains and help in identification of the perpetrator and the victim (esp. when combined with DNA analysis), in reconstruction of the course of the event as well.

The goal of the system is to assist law enforcement administration in investigative proceedings and facilitate subsequent legal proceedings that rely on forensic evidence.
Selected innovative features of the system:
- Reconstruction of the crime scene in 3D virtual reality that retains highly accurate modeling of relevant details, the people present as well;
- Opportunity for experts to draw conclusions based on object–oriented data, even without appearing personally at the crime scene;
- Complex nature of the technological idea starting from hardware to software solutions through database design, to conclude with prototype tests and training in instruction of the end users.

Nevertheless it depends on a system adopted there is no substantial differences as to the methods of conducting crime scene examination in various countries. The software developed in the program incorporates a number of ways of documentation including written reports, photographs, videographs, scene sketching, mapping as well. Therefore it can be very helpful not only to the law enforcement officers, prosecutors, expert-witnesses, but also to private attorneys for demonstration the potential course of events, characteristics of the people present as well, at the crime scene.