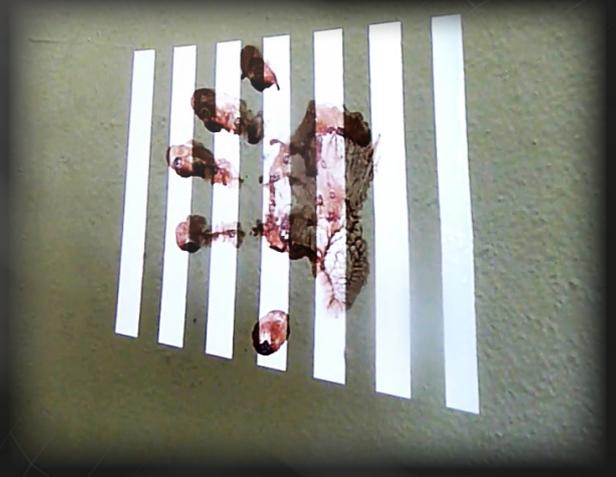


SMARTTECH 3D scanners in criminology



SMARTTECH 3D scanners are used in criminology for detailed analysis of the crime scene in many fields such as: anthropometry, ballistics and trace evidence analysis.



DETAILED IMAGE OF THE CRIME SCENE

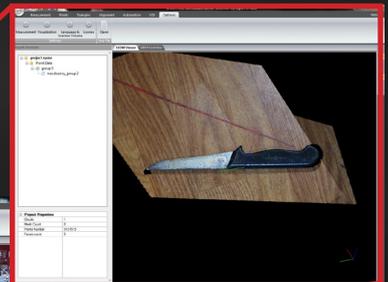
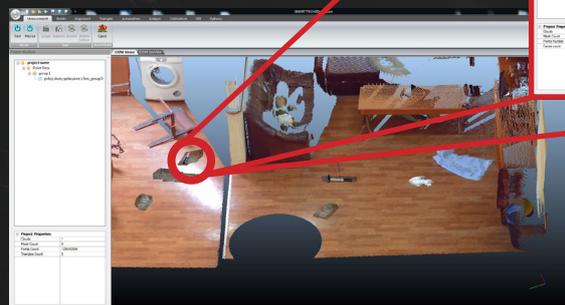
Three-dimensional scanning provides a very precise representation of the examined scene. In the investigation of the crime it is especially useful in documenting the crime scene and all of the objects and trace evidence present there

The conventional methods of documentation are often inaccurate and, what is more important, they don't contain all information needed (e.g. conventional images don't provide information about dimensions and depth of the trace). Long-range laser 3D scanners are used to archive the entire crime scene because of their ability to perform a quick scan with the accuracy of up to a few centimetres. This level of precision, however, is not sufficient for the documentation of trace evidence, such as blood stains, shoe prints or the shape of the nick on the murder weapon – the documentation of this kind of evidence is best performed with 3D scanners with accuracy of 0,05 mm, such as the ones manufactured by SMARTTECH. The measurements from both types of 3D scanners can be combined into a single coordinate system using the software SMARTTECH3Dmeasure.

General scans of the crime scene together with high-resolution measurements of the most important trace evidence allow you to 'go back' to the crime scene: perform the necessary measurements, check the interpretation or run a simulation even when the crime scene is no longer available or is located hundreds of kilometres away.



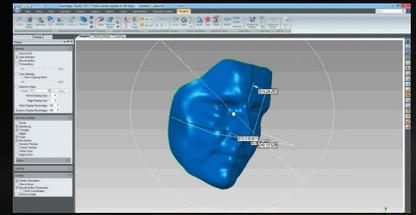
The high-resolution 3D scan of the murder weapon – a cloud of point with 900 pts. / mm² density.



The view of the combined 3D scanning results from the geodetic laser scanner with the high-resolution scanner detailing the most important elements.

ANTHROPOMETRY

For anthropometric research the best solution is the scanner scan3D med allowing for a fast measurement (under 1 sec.) and realistic colour representation. These characteristics enable the scanner to be used in the monitoring, for the precise determination of personal traits such as facial typology, the shape of the earlobes and for the creation of a realistic facial composite.



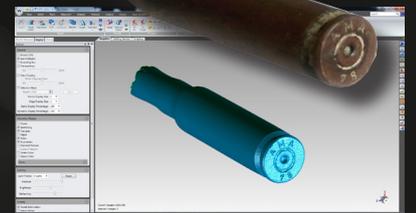
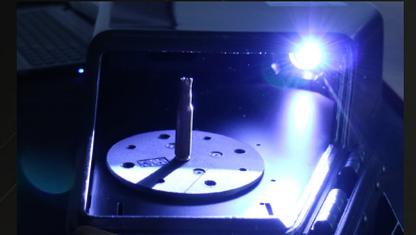
The three-dimensional face analysis

BALLISTICS

Every firearm leaves a specific trace on the casing – the point of impact. By comparing the shape of the point of impact of the firing pin on several casings you can determine whether they were fired from the same firearm. The scanner SMARTTECH3D mini, thanks to its high accuracy (0,01 mm) and resolution (up to 2000 measurement points per mm²) enables you to accurately document the shape of the primer and the deformation of the casing after firing.

Additionally, the resulting virtual model of the bullet allows you, with the use of appropriate software, to run a simulation of the bullet trajectory, check the air resistance and the impact force when it hit the object. This can allow you to determine with high probability the distance of the shooter or the type of weapon he used.

Using the measurements the models of primer traces can be archived in a database, and then used for the identification of the type of weapon used in a given incident as well as for the rapid determination of the owner.



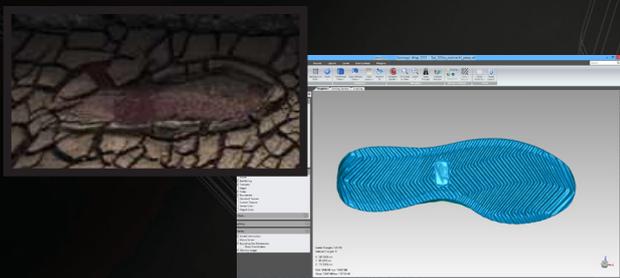
The 3D model of the bullet casing created from the 3D scans.

TRACE EVIDENCE ANALYSIS

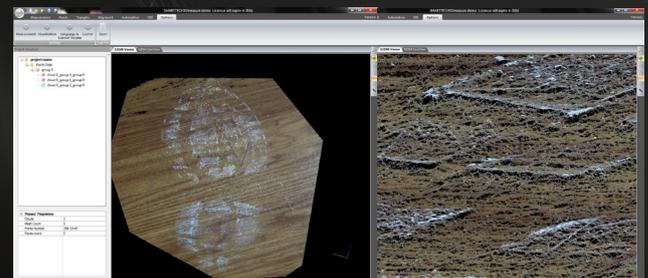
The conventional method of taking pictures of the trace evidence doesn't reflect a lot of important information. Using a 3D scanner to scan trace evidence enables you to measure traces depth, different angles or to compare several trace evidence to each other. With a lightweight and easy-to-use scanner scan3D UNIVERSE a police officer acquires a tool allowing him to transport the trace evidence in full from the crime scene to the laboratory irrespective of whether it's a shoe print in soft ground or just a traces of braking on the asphalt.

MEASUREMENT RELIABILITY AND THE AUTHENTICITY OF THE RESULTS

The evidence from the crime scene, being the crucial information for the conducted investigation have to be reliable and indisputable. All 3D scanners from the company SMARTTECH are certified for their accuracy of measurements according to the metrological standards. The files format used for forensic applications can be customised so as to eliminate the possibility of data manipulation by an unauthorized party.



The 3D model presenting the outsole of a shoe, obtained by 3D scanning the shoe print in the ground.



The 3D scan showing the shoe print on a floor enabling the retention of the trace evidence for precise dimensional analysis (measurement in mm between any two given points).

