

ELCOVISION 10 Forensic – The ELCOVISION 10 Tool for Crime Scene Investigation

The **ELCOVISION 10** product family has a simple philosophy: Be as universal as possible. But sometimes there is a need for special tools: The ELCOVISION 10 Forensic plugin offers some easy to handle specialized tools for blood stain analysis.

This is the typical workflow using ELCOVISION 10 Forensic for calculating the area of origin of bloodstains by calculating the trajectories of all bloodstains and intersecting them in space.

First the crime scene is photographed and the images are orientated in ELCOVISION 10.



Crime scene Images



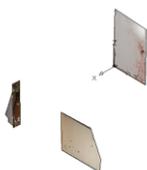
Orientated Images

The orientation of the images can be done either manual by an operator or fully automatic by ELCOVISION 10.

The orientated images, the so-called ELCOVISION 10 project, is loaded into the AutoCAD environment of ELCOVISION 10. Here we can create a detailed drawing of the crime scene with our photogrammetric evaluation tools if needed.



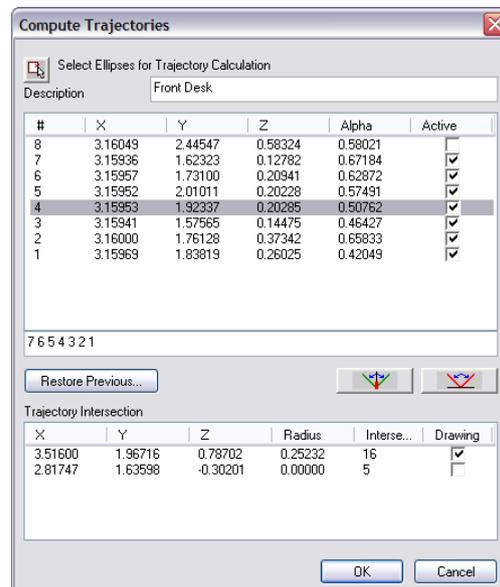
However for the crime scene analysis task the most important ELCOVISION 10 function is the digital rectification of surface textures containing blood stains directly into the drawing. This generates a true to scale drawing containing rectified textures of the scene at the true 3D position:



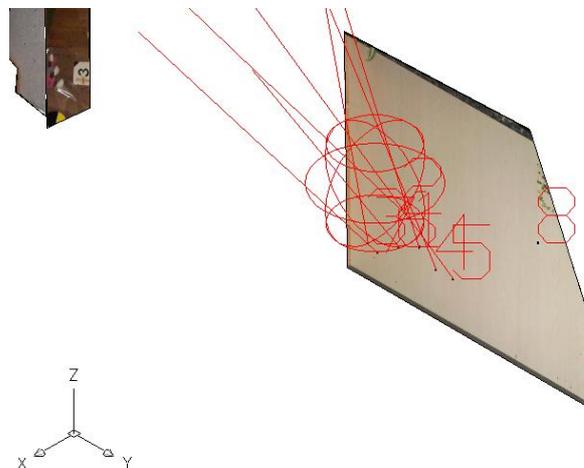
The ELCOVISION 10 Forensic plugin now features various tools to draw very precise ellipses around the rectified bloodstains. There are also powerful editing tools to adjust the ellipses precisely over a bloodstain by tilting the impact

angle or adjust the ellipse axes or origin. By using these special drawing tools it is guaranteed that the bloodstain-circumscribing ellipse is at the exact same 3D position in space as the bloodstain itself:

After a number of ellipses are drawn the trajectory-calculating tool is used to select a number of bloodstains and calculate their trajectories. The software detects the bloodstains belonging together and calculates the 3D position area of origin and also the volume of this area.

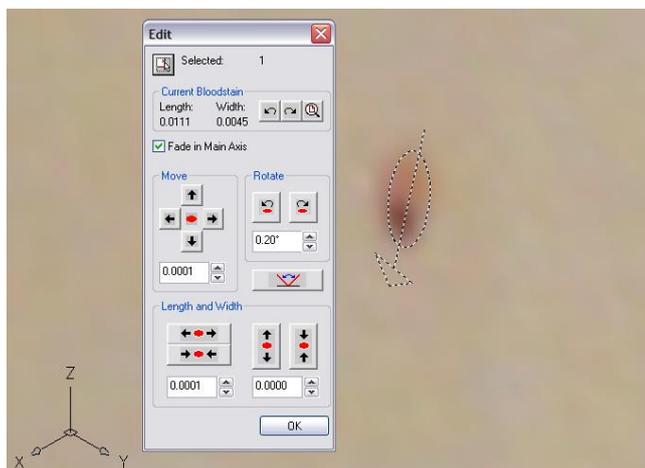


This area of origin is drawn instantly into the CAD drawing for visual inspection of the result:



ELCOVISION 10 Forensic Functions

- Ellipse drawing exactly on the surface of a raster image using center point direction and major axis or by defining major and minor axis.
- Ellipse editor to alter all of the ellipse parameters like normal vectors, direction, rotation etc. Walk through and optimal zoom to all selected ellipses in a drawing for fast workflow.
- Compute trajectories from bloodstains which belong together with visual error detection.



ELCOVISION 10 Technical Data and Function Overview

Image Recognition and Image Processing

Reads and writes almost all known digital image formats

Full automatic raw-file converter with automatic image optimizing for maximum image quality

Integrated image processing module with color and contrast adjustment, gamma correction etc.

Optimized image display in the measurement magnifier for easy and precise measurement even in underexposed or overexposed image parts.

Réseau Measurement

Full automatic réseau measurement of digital images

Full automatic réseau measurement of réseau images of metric cameras with automatically chosen transformation: affine, helmert, projective or polynomial

Digital Rectification ELSP

Definition of 2D-rectification planes with known rectangles or arbitrary distance squares with 5 known distances

Definition of 2D-rectification planes by perpendicular and parallel lines and at least one known distance

Linking of 2D-rectification planes among themselves and also linking them into the 3D-space using 3D-control points

Definition of balanced 3D-rectification planes using 4 or more 3D-control points

Arbitrary trimming of the rectification planes with automatic determination of the circumference and the area of the resulting rectification plane

Optional lens distortion correction

Automatic rectification as many as desired rectification planes into a digital single picture e.g. an orthophoto

Full automatic generation of 3D-rectification planes from AutoCAD surface models

Full automatic transferring of 3D-rectified textures into AutoCAD

Automatic Image Measurement Modes

Automatic measurement of réseau crosses with sub pixel precision

Automatic measurement of targeted points with sub pixel precision

Automatic measurement of corners and edges

Measuring assistance by epipolar lines

Methods of Orientation

Arbitrary definition of the system of coordinates: Local by distances and/or control points, or with control points within a superior system of coordinates

Full automatic photo orientation

Single and two photo orientation
Multi photo orientation

Bundle adjustment with up to 1000 pictures and simultaneous camera calibration

Orientation of full spherical images

Definition of 3D Planes

Balanced spatial plane by 3 or more 3D-points

Definition of parallel planes by points or with arbitrary distance to other planes

Definition of perpendicular planes to arbitrary other spatial planes

Measuring Methods for Point Measurement and CAD Plugin

Rectification Measurement

Mono Photo Measurement: Intersection of a measuring beam with a 3D-plane

Two Photo Measurement: Balanced spatial intersection of two measuring beams

Multi Photo Measurement: Balanced spatial intersection of two or more measuring beams

Stereoscopic Measurement: Epipolar transformation of non stereoscopic images into a stereo image pair and displaying them with various methods like LCD shutter or anaglyph images.

Measurement from full spherical images

CAD Integration

Seamless integrated into the following CAD Systems, all drawing functions of the CAD become measurement functions

AutoCAD: 2009–2016 (32/64 Bit)
BricsCAD V12-V15 (32/64 Bit)

Additional CAD Functions

Superimposition of the CAD drawing into the digital images

Draw perpendiculars with one single measurement

Measuring and drawing of single segmented lines

Simultaneous measuring and drawing of 3D-trimmed lines

Simultaneous measuring and drawing of 3D-balanced lines

Simultaneous measuring and drawing of UCS aligned lines

Circle intersection construction function

Drawing of 3D-circles and circular arcs with three 3D-measurements with plausibility check

Drawing 3D-rectangles with three 3D-measurements with plausibility check

2D-projection of a drawing into any plane

Optimized merging of single lines into 2D-polylines and 3D-polylines

Integrated 3D-surface modeler generating waterproof surfaces from 3D-clouds of points and 3D-line drawings

Built-in generating of contour maps from surface models

Special measuring functions for inserting blocks with automatic block adjustment

Special measuring functions for measuring cylinders and right parallelepipeds

Supported Operating Systems

Windows XP/Vista/7/8/10

