

PointSense Heritage

Rapid 3D modeling by integration of point clouds and photos

FARO



Areas of application

- PointSense Heritage is suitable for documentation in built heritage conservation, archaeological history research, as well as for complex three dimensional archaeological excavations. Meaningful and detailed image plans can be created or 3D models can be constructed from laser scan data and photos.
- Special features
- Fast construction of 3D models thanks to the integration of point clouds and photos
- Photogrammetrical functionality as a supplementary tool
- Computation of real orthophotos
- Generation of detailed image plans, in a plane, of point clouds and photos of towers, vaulted ceilings, ceiling paintings, facades, roofs, etc.
- Automatic image rectification from ReCap Photo and Agisoft PhotoScan import
- Classical features
- Process thousands of millions of surveyed points with AutoCAD
- Intuitive navigation in the planar view
- Combination of scanner data, CAD and photos
- Efficient Data management: Isolation, colouring, masking and naming of point cloud regions

High-tech documentation in AutoCAD of historical buildings and archaeological sites

PointSense Heritage makes functions available for laser scanner data from which the documentation of built heritage conservation and archaeological excavations (such as image plans, floor plans, sections and 3D models, etc.), and where applicable photo like results, can be generated. This combination, from within AutoCAD, of laser scanning and photogrammetry offers interesting possibilities together with the possibility of high definition and precise results.

Planar Views from Scans

The planar view of the scan data offered by PointSense produces a photograph like clear picture of the individual scans and allows a significantly more intuitive navigation of the scan data as in the depiction of the point cloud. The accidental snapping of underlying points is not possible in this view.

Fast construction of 3D models

PointSense Heritage extends AutoCAD by adding photogrammetrical functions. High definition, rectified photos support the processing of the laser scanner data and allow the fast construction of 3D wireframe models and surfaces. The photos from commercially available digital cameras are rectified and embedded into the drawing. The geometric objects drawn over

these photos are placed automatically in the correct place in the point cloud.

Classical Photogrammetry in AutoCAD

Identical points in at least two photos taken from different points can be interpolated by alternately selecting the points in the photos. PointSense Heritage calculates the 3D coordinates of the points. It is thereby possible to comfortably carry out modelling in space without having to use laser scanner data.

Create real orthophotos

True orthophotos are computed through the combination of point clouds and photos and can be used as the basis for image plans. In the computation the point cloud provides the precise surface information whilst the colour information used in the image produced is gained from the photos. True orthophotos usually have a higher resolution and are denser than the orthophotos produced solely from point cloud data.

Unrolled image plans

By unrolling point clouds and photos of towers, vaulted ceilings, ceiling paintings, facades, roofs, etc. detailed, true to scale image plans can be generated, that can be additionally supplemented with further CAD information and dimensioning.

Technical Requirements

<i>Platform</i>	AutoCAD and the associated vertical products such as Civil 3D, Architecture or Map 3D subsequent to the 2013 versions. From the 2015 releases onwards 64-bit support only. Should you be using older Autodesk products please check with your FARO 3D Software distributor.
<i>Operating system</i>	Dependent on the version of AutoCAD being used, recommended is a 64 bit system.
<i>Hardware requirements</i>	Computer: Graphic card as recommended by Autodesk, processor at least 2.5 GHz, RAM at least 8 GB; Laser scanner - type to suit the job in hand; optionally a commercially available digital camera.
<i>Data requirements</i>	Registered, that is to say they are oriented to each other, and if applicable rectified photos.
<i>Supported scan data formats</i>	Riegl RiScanPro projects (RSP), Leica (PTZ, PTS, PTX), ASCII, LAS, E57, Zoller&Fröhlich (ZFS, ZFPRJ), Topcon (CL3, CLR) Leica (PTG) and Faro (FLS, FWS).
<i>Supported image formats</i>	All AutoCAD supported image formats, e.g. TIF, BMP, JPEG, PNG rectified images from Riegl RiScan-Pro projects, Trimble RealWorks Survey orthophotos, Reconstructor Orthophotos, Agisoft PhotoScan format (XML), ReCap Photo (RCP).

Important features

General features

- Point cloud management and clipping
- Import of various scan data formats
- Import of orthophotos (Reconstructor, Trimble RealWorks)
- Definition, editing, colouring and management of slices and regions of point clouds
- Import rectified images from Riegl projects
- Deformation analysis
- Elevation plans
- Ortho images of point clouds
- 3D distance dimensioning
- Create rotated door and arch plans
- Flatten the drawing

2D Modelling

- Line/polyline fitting - with constraints
- Polygon fitting with a variable number of nodes
- UCS independent drawing of arcs and circles through 3 points
- Automatic polygon fitting in multiple slices
- various construction tools

3D Modelling

Cylinders and truncated cones

- Cylinders and truncated cones fitting
- Drawing cylinders and truncated cones
- Convert cylinders and truncated cones into solids
- Cylinder and truncated cone analysis (deformation analysis)

Planes

- Plane fitting - with constraints
- Plane fitting with only one click
- Automatic determination of plane boundaries
- Extend (two planes)
- Intersection line (two planes)
- Intersection point (three planes)
- Intersection lines (three planes)
- Change boundaries
- Flatness analysis, solid modelling (2.5D meshing, terrain model) volumetric calculations

Working with images

- Image rectification
- Insert rectified image (kubit ORI format)
- Clip oriented image
- Import Recap Photo (fast, automatic image orientation for mono-plotting, true to scale image plane and orthophotos)
- Agisoft PhotoScan import (automatic image orientation offline)
- Insert raster image
- Control point management (define, import, adapt size)
- Define the UCS in respect to current view
- Camera view and camera navigation
- 3D drawing with rectified images and surfaces (point clouds, planes, cylinders)
- Photogrammetrical multi image processing
- Computation of real orthophotos
- The unrolling of point clouds and photos, cylindrical and prismatic objects onto the plane (result is a plane raster image)

Planar View

- Displaying the scan data in a photo like, planar view
- Transfer coordinates from the planar view into the AutoCAD drawing
- Freely defined AutoCAD command macros
- Distance and coordinate picking
- Colouring of scans according to intensity, distance, original RGB

Trial versions

- PointSense programs can be tested free of charge and without obligation. You can find a request form on the website www.kubit.de. Or simply call by phone.

References

- PointSense software is used worldwide and industry wide:
- National Parks Service
- T. Baker Smith, LLC
- SNC-Lavalin Inc.
- JE Dunn
- ...and many others too.

Free trial!

PointSense programs can be tested free of charge and without obligation. You can find a request form on the website www.FARO-3D-Software.com. Or simply call by phone.

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