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ISPRS WG V/3  
Terrestrial laser scanning  
[www.commission5.isprs.org/wg3](http://www.commission5.isprs.org/wg3)

## Terrestrial laser scanning software survey

The WG conducted a software survey amongst its members. The aim was to get an overview on the available software and how the software is used. 19 questionnaires were returned. The results are therefore not necessarily representative for the entire market, but reflect the use of software amongst the members.

More than 30 software programs were identified. Their names, a www-link, and a very short description, not meant to be a complete description of the program, are given at the end.

All together four classes of software could be distinguished.

### 1. Frequently used programs

These programs are well-known and used in many groups. They are used for inspection of the data, formation conversion, measurement in the point cloud, and registration. Registration can either be done by targets or ICP. Some of these programs can also be used for modeling. Below the programs are given with additional comments.

*CloudWorx*: like Cyclone, but no control of scanners, less modeling options

*Cyclone*: controlling the HDS scanners, fitting of primitives

*Geomagic*: NURBS modeling

*Polyworks*: creation of polygonal models

*RiScanPRO*: controlling the Riegl scanners

### 2. Less used 3<sup>rd</sup> party programs

These programs were mentioned only once or twice in the returned questionnaires. Some programs are only useful for visualization and measurements in the point cloud, others are complete 3D modeling packages. The list of these programs is given below.

*3Dipsos*, *3dStudio Max*, *Blender*, *Deep Exploration*, *Imedit*, *iQScene*, *I-Site studio*, *Pointools*, *Rhino*, *Scanalyze*

Within this list also very general purpose software falls: CAD and GIS packages and tool box programs. Specifically mentioned were the programs: *Imagine Virtual GIS*, *Matlab*, *MicroStation*

3. **Proprietary and very specialized software**

These programs are developments of research groups and used (mostly) within this group. Like in the second group of programs, they can have a very specialized purpose, e.g. suited for a domain, or performing only one specific task. The list of these programs is given below.

*Dibit, LS3D, Orpheus, Piper, SCOP++*

4. The fourth group of programs are those not used by the members of the WG who returned the questionnaire. This list also includes dedicated software for all processing steps of laser scanner data.

Concerning the usage of the programs the greatest variety of programs in use can be found in modeling. Entirely automated registration, i.e. without the manual specification of approximate values, is only implemented in research software currently.

The software survey can be seen as a first step for getting an overview on available software products. A quantitative comparison of the program capabilities should follow.

3-D PlantLINx	<a href="http://www.inovx.com">www.inovx.com</a>	Reconstruction of industrial sites
3D Studio Max	<a href="http://www.autodesk.com">www.autodesk.com</a>	General 3D modeling
3D-Extractor	<a href="http://www.callidus.de">www.callidus.de</a>	Registration, simple reconstruction
3Dipsos	<a href="http://www.mensi.com">www.mensi.com</a>	Registration, meshing, free form modeling, industrial site reconstruction
BitWyse 3D Modelling	<a href="http://www.bitwyse.com">www.bitwyse.com</a>	Reconstruction of industrial sites
Blender	<a href="http://www.upperfold.com">www.upperfold.com</a>	General 3D modeling (freeware)
CloudWorx	<a href="http://hds.leica-geosystems.com">hds.leica-geosystems.com</a>	Registration, simple fitting
Cyclone	<a href="http://hds.leica-geosystems.com">hds.leica-geosystems.com</a>	Scanner control, registration, simple fitting
Deep Exploration	<a href="http://www.righthemisphere.com">www.righthemisphere.com</a>	Visualization
Dibit	<a href="http://www.joanneum.at">www.joanneum.at</a>	3d tunnel processing of laser scanner data
Geomagic	<a href="http://www.geomagic.com">www.geomagic.com</a>	General 3D modeling, free form modeling
Imagine Virtual GIS	<a href="http://www.leica-geosystems.com">www.leica-geosystems.com</a>	GIS
Imedit		Also from Innovmetric ?
iQscene	<a href="http://www.iqvolution.com">www.iqvolution.com</a>	Registration, simple reconstruction
I-SITE studio	<a href="http://www.isite3d.com">www.isite3d.com</a>	Registration, simple reconstruction
LFM	<a href="http://www.zf-laser.com">www.zf-laser.com</a>	Segmentation, model reconstruction
LS3D		Registration, proprietary development at ETH
Matlab	<a href="http://www.mathworks.com">www.mathworks.com</a>	General purpose computing
Maya	<a href="http://www.alias.com">www.alias.com</a>	General 3D modeling
Microstation	<a href="http://www.bentley.com">www.bentley.com</a>	CAD
Orpheus	<a href="http://www.ipf.tuwien.ac.at">www.ipf.tuwien.ac.at</a>	Registration also with other observations (images, total station, ...)
Phidias	<a href="http://www.phocad.de">www.phocad.de</a>	Texture mapping and monoplotting, both with images
Piper		Reconstruction of industrial sites, development at TU Delft
PointCloud	<a href="http://www.kubit.de">www.kubit.de</a>	Measurement and selection in point cloud
PointShop 3D	<a href="http://graphics.ethz.ch/pointshop3d">graphics.ethz.ch/pointshop3d</a>	Registration, visualization (GPL)
Pointools	<a href="http://www.pointools.com">www.pointools.com</a>	Viewing and measurement in point cloud
PolyWorks	<a href="http://www.innovmetric.com">www.innovmetric.com</a>	Registration, measurement, 3d polygonal models
QT Sculptor	<a href="http://www.polygon-technology.de">www.polygon-technology.de</a>	Registration, Meshing
RapidForm	<a href="http://www.rapidform.com">www.rapidform.com</a>	Registration, Meshing, 3D modeling
RealWorks	<a href="http://www.mensi.com">www.mensi.com</a>	Registration, point cloud inspection, line extraction
Rhino	<a href="http://www.multiaxis.com">www.multiaxis.com</a>	NURBS modeling
RiScan PRO	<a href="http://www.riegl.com">www.riegl.com</a>	Scanner control, visualization, registration
Roland PixForm	<a href="http://www.rolanddg.com">www.rolanddg.com</a>	Registration, NURBS modeling
Scanalyze	<a href="http://graphics.stanford.edu/software/scanalyze">graphics.stanford.edu/software/scanalyze</a>	Registration
SceneVision	<a href="http://www.3dtech.com">www.3dtech.com</a>	Registration, measurement (Forensics)
SCOP++	<a href="http://www.ipf.tuwien.ac.at">www.ipf.tuwien.ac.at</a>	Digital Terrain Modeling package
Surveyor / Reconstructor	<a href="http://www.topotek.it">www.topotek.it</a>	Registration, measurement
voidworks	<a href="http://www.isite3d.com">www.isite3d.com</a>	Registration, polygonal modeling, volume computation