# New SpatialAnalyzer Version: SA 2018.12.07

One of the very significant advantages of SpatialAnalyzer is that development occurs at a brisk pace. New feature requests, bug fixes, and changes are implemented quickly, giving you the opportunity to start taking advantage of new or requested features in a very short time.

IMPORTER ENHANCEMENTS

Point Cloud Import Expansion

⌐ Added support for E57 Point Cloud Import, which includes either intensity or Colorization for easier visual processing.
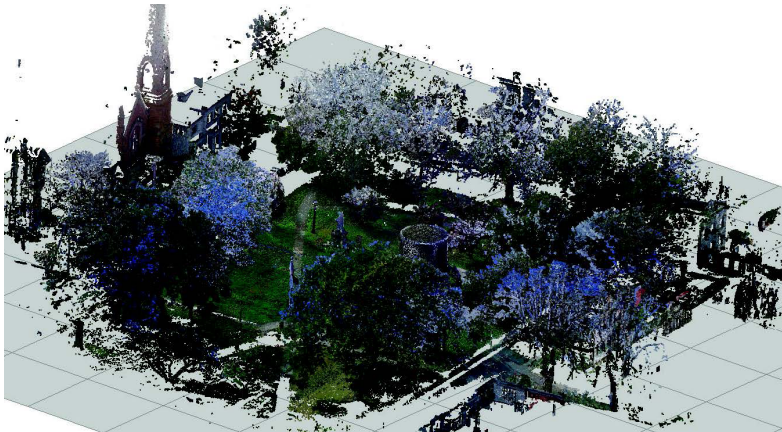
⌐ Added support for Importing Leica SDB files directly through SA without the need to go through the theodolite manager.

⌐ Added import support for *.PTX format ascii files.

CLOUD PROCESSING IMPROVEMENTS

### Adding Cloud Clipping Plane Button

SA needed an easier way to define a clipping plane for a cloud when actively measuring parts with a handheld scanner.
A button was added to the Graphic Control Toolbar for this purpose:

A single click will build a placeholder plane that can then be measured to define he default cloud clipping plane in the job.
The icon will then change to show that the plane is sent and it also provides direct access to the planes settings.

Auto Filter to Vectors

A new cloud construction tool has been added to filter cloud points within a proximity to vectors and build mini-clouds with the selected cloud points. This makes it easy to perform detailed patch or zone to surface analysis on curves surfaces.
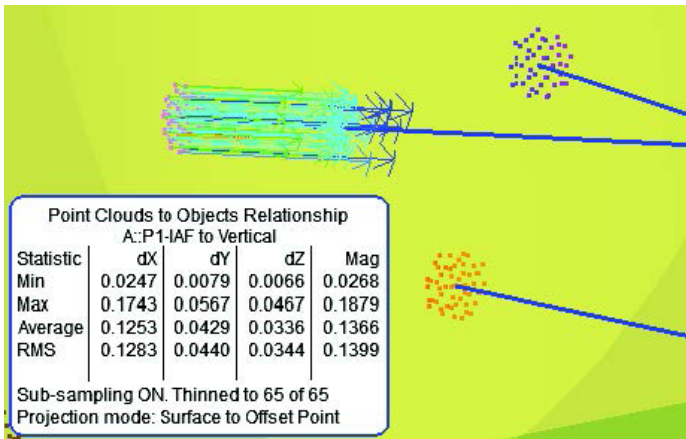

Auto Filter to lines and B-splines

A new auto filter option has been added to detect and isolate cloud points within a proximity to Spline segments or circular arcs and a geometry relationship autofilter has been added to associate cloud data within proximity to nominal GR-Lines.

Enhanced spline from Cross section builder

Our existing tool to build b-splines from cross section clouds has been enhanced to make it much easier to use for construction of a series of b-splines.
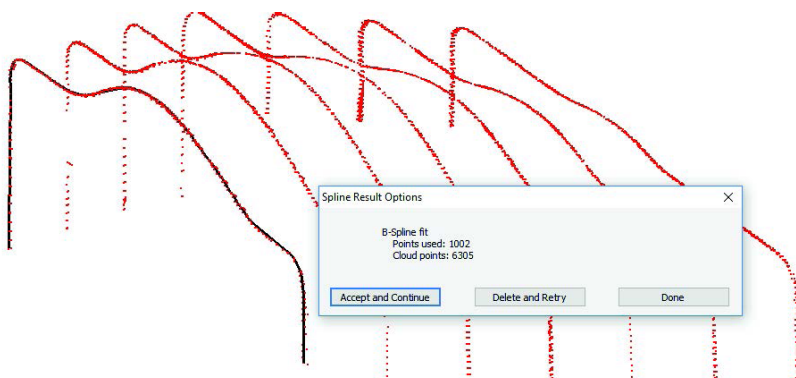
Feature Extraction from Clouds

Added the ability to select a subset of cloud points for use in feature detection. This makes it much easier to find feature within large scans by providing the ability to isolate the area of interest with more accuracy.
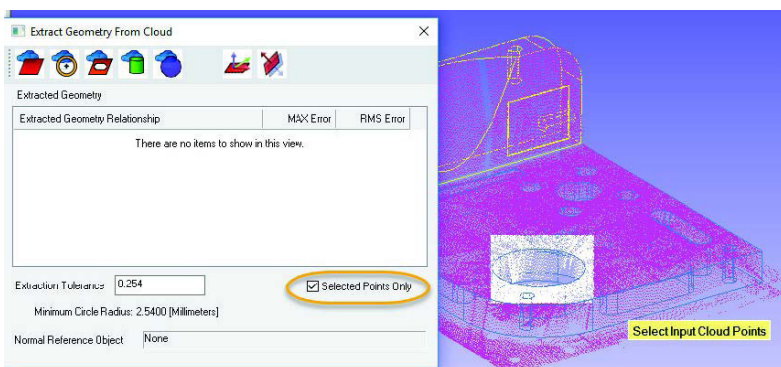
Also added the ability to use Cloud to Surface Face relationships in the Auto Filter to Nominal 3D extraction to isolate point cloud relating to individual CAD faces.

FEATURE INSPECTION IMPROVEMENTS

New Tree Hover Mode for Feature Identification

A new option has been added to the tree to enable a hover mode that will highlight things in the graphics based upon your mouse position in the tree. This can be very helpful in identifying which feature is which in the tree and graphics. To enable it, right-click in the tree and select **Enable Hover Mode.**

Add Option to display RMS in the HUD

The heads up display (hud) within the graphics displays the current trapping feature name and the XYZ position of incoming points. It now can displays the current RMS for the feature as it updates (enabled through the users options).

Build 2D Features from B-Splines

A new tool has been added to build Circle and Lines from selected B-Splines for use in cross section analysis.

Splines can be built from the intersection of a plane and a CAD model and then this function allows for selection, it searches through them, and builds nominal GR features from the true liner and circular splines. This sets up auto filter and cross section analysis.

Improved Auto-Vector Management

It has been difficult at times to tell which vectors are auto-vectors linked to relationships and which were static. This as been addressed in a couple of ways:

- The auto-vectors now appear under the relationship in the tree.
- If a relationship is renamed the auto-vectors are automatically renamed as well.
- Empty placeholder vector groups are marked with grey text just like placeholder geometry.

Added IJK criteria to Geometry Relationships

By popular demand geometry relationships now include a normal vector component display as additional criteria in the feature properties.

Added Geometry Fit Settings display option.

The fit settings used to compute the fit in a geometry relationship can now be easily appended to the end of the feature table with a check box control and applied to other features as needed:

Geometry Relationship A::Circle						
Criteria	Nominal	Measured	Delta	Low Tol.	High Tol.	Tolerance
Diameter	3.4500	3.4403	-0.0097	-0.0100	0.0100	Pass
X	81.7850	81.7838	-0.0012			
Y	130.4500	130.4438	-0.0062			
Z	-14.1200	-14.1206	-0.0006			
Mag XYZ			0.0063	-0.0050	0.0050	0.0013
I	0.0000	0.0009	0.0009			
J	0.0000	-0.0026	-0.0026			
K	1.0000	1.0000	-0.0000			
Computation Technique						Min Circumscribed
Measured Side						Outside/Above
Measurements						26

Added Cylinder Direction Definition

Introduced a "First to Last" cylinder axis direction option for geometry fits to allow a more reliable cylinder axis direction to be set as part of the measurement process.

GD&T ENHANCEMENTS

Datum Targets

Added ability to anchor datum targets precisely using an optionally selected reference point as an anchor.

Re-measure Failed Checks Inspection Option

Its often desirable to clear failed GD&T checks and re-measure them to ensure that the measurements did not contribute the pass/fail status of a check. A convenient option has been added to clear the point associations from only the failed feature checks and locks out the passing checks from the inspection list for re-evaluation.

Improved Cylinder Extraction

Additional checks have been added to isolate coaxial cylinders and ensure that the correct point associations are made for those cases where a hole's are perfectly aligned but need to be handled separately.

REPORTING ENHANCEMENTS

Cloud Point Dimensions

Point to Point and Point to Object dimensions can now be built directly from cloud point selection. This uses a volume or voxel processing strategy to build an accurate representative point at the selected cloud point location.
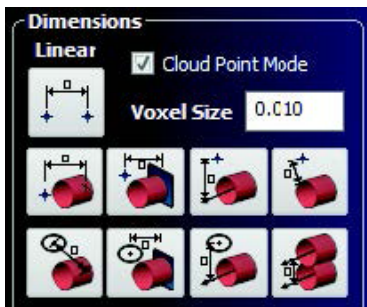
Improve Callout Placement

Locked Callout views now provide an enhanced callout placement logic that trackers the position of callouts relative to other objects in the view. This provides the ability to view callouts on different screens of different aspect ratios without losing the callout placements.

Zoom-able Callouts

Its now possible to adjust the overall display size for all the callouts within a callout view. To do so right-click on the callout category in the tree and choose **Enable Zoomable Callouts**. Then within an active callout view, hover over one of the callouts and hold Ctr+Shift and use the mouse wheel to adjust the callout size as needed.

Updated Group Manager

Group manage got some much needed upgrades including: moving groups between collections, better point and collection icons, and stability improvements.

Expanded Frame Reporting Options

Frame reporting options can now be edited to display in a selection of fixed and Euler formats:
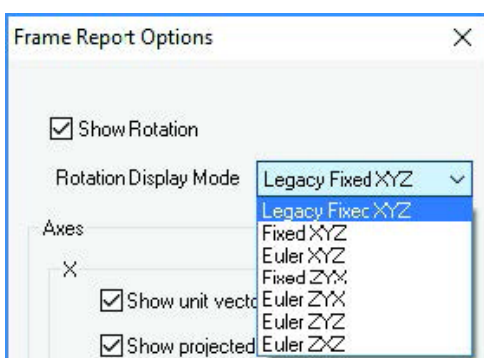
Added Copy/Paste Between SA Reports

Its now much easier to build reports from existing content. Tables from an existing report can be copied and pasted directly into a separate report.

Improved traceability

SA's traceability has always been a high priority. In this version we have added even greater traceability measured clouds and frames. The initial measurement transform is now saved with clouds and 6D frame measurements so that this transform relative to the instrument can be rest if needed. A new option under analysis has been added for this purpose:
Analysis>Reset Associated Object Transforms.

Added Vector Group to Vector Group Relationship

Designed with shim and gap applications in mind, this new relationship builds a composite vector group from two corresponding vector groups. The resulting graphical and numerical statistics can be reported directly, defining the gap width, and the relationship can be used within a relationship fit to equalize the gap distribution relative to a nominal.

INSTRUMENT DEVELOPMENTS

Instrument Labels

A new option has been added to show instrument labels making it easier to identify which instrument is which in the graphics.

Instrument Buffer Controls

Added controls to the instrument properties dialog to control buffering necessary to handle large amounts of data measured very quickly.

Add support for Faro 6D Probe

Faro now offers a 6D probe along with their new VantageS6 and VantageE6 tracker models. This update requires a new JRE version (V5.1.3.1 or newer) which is required for all Faro trackers.

Added support for Faro Arm Driver v6.2 and 8th axis stage

The new rotary table inspection process is now supported in SA.

Added New Hexagon Absolute Arm

This includes support for RDS 5 and the RS5 Laser Scanner as well as all sizes of the new Hexagon Absolute 6 and 7 degree of freedom arms.

MS60 Scans include Intensity

Leica Multi-stations scans taken from within SA now include intensity colorization of point clouds automatically.

Added Target Access from the Total Station Toolbar

It was not possible in prior versions to directly access and modify target definitions from within the instrument toolbar for a Total Station. There is now an option to directly access the Target and Retro's database just like in the tracker toolbar.

GSI VSTARS IMPROVEMENTS

S-Mode Data (the interface's [Data>>SA] button) can now be optionally sent to SA as Cloud(ProSpot) data. Added MP Instrument Operations Check string commands to change the "Use VStars Target Label" setting for Target data.

SCRIPTING

Import Specific Collections

Import SA File has been expanded to allow import of specific collections by name, making it much easier to merge job files through MP.

Notify User Time-outs added

Notify user commands now have an option to set a timeout so that users do not need to return to the computer to continue in the script.

Append and Overwrite for Notes

Append or Overwrite control has been added for notes added to folders, collections, and objects.

SA SDK Missing Arguments

Many MP arguments that were not previously supported through SA SDK are now available (see readme for details).

SA
SpatialAnalyzer

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