

GTU progress with 3D laser scanning hardware & software education

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Laser Scanner Focus 150



Tripod



FARO SuperSphere system



SCENE software is designed for viewing, administration and working on, of extensive 3D scan points. It allows the user to manipulate raw 3D scan points and acquire with analysis functions initial point cloud data comprehension. Complete workspace creation and manipulation tool. Contains all functionality of FARO Scout plus functions required for scan placement



PointSense Heritage for AutoCAD, Educational License, Single Seat (SLM), incl. a dongle

Course Description: "3D Laser Scanning Hardware and Software"

Department: Geodesy and Geoinformatics (GTU)

Introducing basic principles of 3D and Terrestrial Laser Scanning – laser scanning principles, equipment and systems, data acquisition and data processing techniques, data organization, etc.

(3 academic hours)

Explaining 3D lasers scanner equipment (FARO FocusS 150) and accessories – 3D Laser Scanner set and its carry case, battery and charger, ac power, tripod set-up, scanner mounting, powering on/off, registration spheres and targets. Scan parameters and profiles (setting resolution, quality, range, sensors, colours, scan duration and size), scan start & stop, organising scan data files. Health & safety induction in laser scanning and outdoor geodetic measurements.

(6 academic hours)

Preparatory arrangements, organising and conducting 3D Laser Scanning field campaign – Planning logistics and site access. Transporting personnel & equipment. Health & safety on-site tool-box talk for laser scanning and outdoor work. Deploying scan equipment, accessories. Setting up the site with scanner and registration kits. Field measurements and quality checks, data collection and storage.

(12 academic hours)

Introducing basic principles of 3D Geovisualisation and Photogrammetry.

(3 academic hours)

3D laser scanning point cloud data import and pre-processing – Point cloud data import and pre-processing with specialised software. Project set-up, quality checks and data preparation for further precision processing.

(3 academic hours)

Point Cloud processing methods and software functionalities (SCENE) – Point cloud project, data setup, compensation and transfer, scan processing and registration, 3D surfaces rendering and meshing, automatic HDR image mapping, CAD export and data exchange.

(8 academic hours)

Practical sessions on Point Cloud processing of field data example for a cultural heritage object.

(4 academic hours)

3D Geovisualisation and Photogrammetry methods & software functionalities (PointSense Heritage) – import point cloud and photos into CAD, planar views, clipping and slicing, unwrapping, construction of 3D models, classical photogrammetry, creation of orthophoto, modelling and analysing surfaces and volumes.

(8 academic hours)

Practical sessions on application of 3D Geovisualisation and Photogrammetry of field data example for a cultural heritage object.

(4 academic hours)

Skills

Based on the obtained knowledge, the student is to be able to understand novel geospatial technologies, such as laser scanning, point cloud processing and 3D geovisualisation and be exposed to basic knowledge how to use these instruments in sectoral applications such as cultural heritage and other sectors, developing ability to:

Apply obtained knowledge of laser scanning measurements in practical projects

Apply obtained knowledge of point cloud processing in practical projects

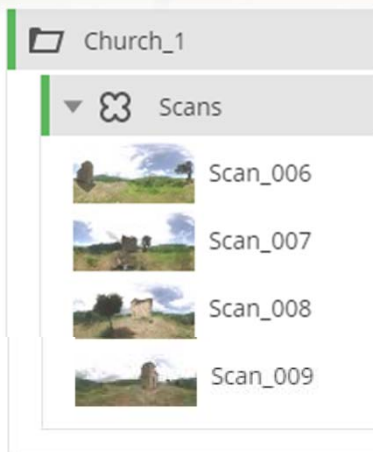
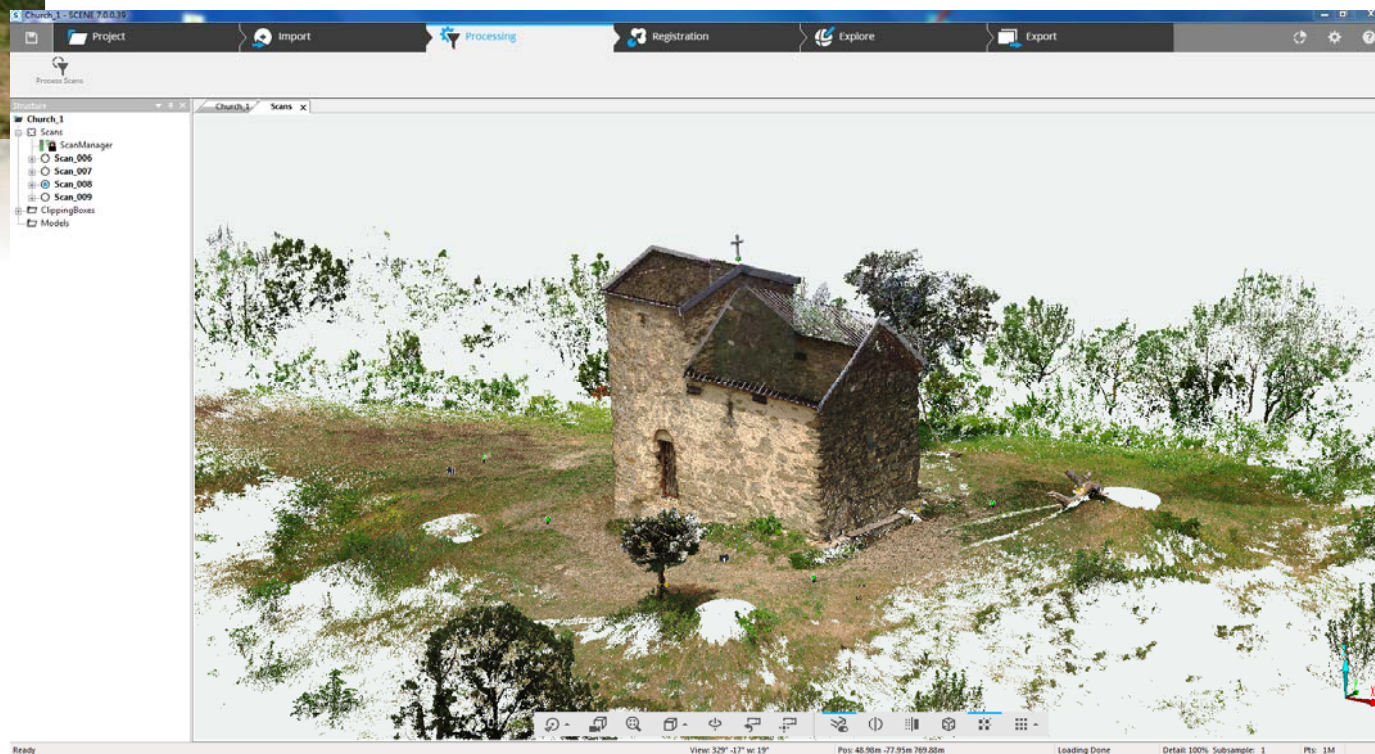
Apply obtained knowledge of 3D geovisualisation and photogrammetry in practical projects

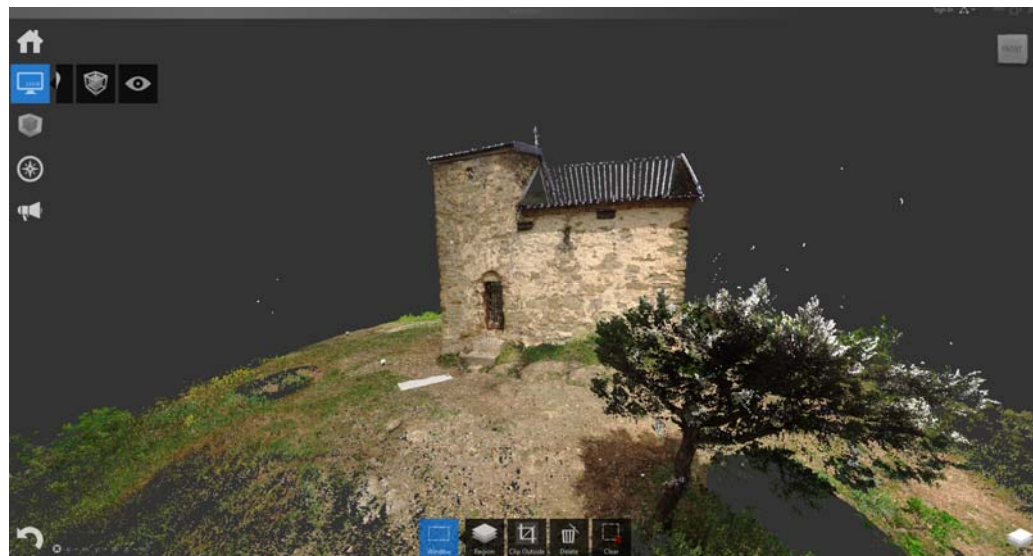
Project - Church Kalaubani



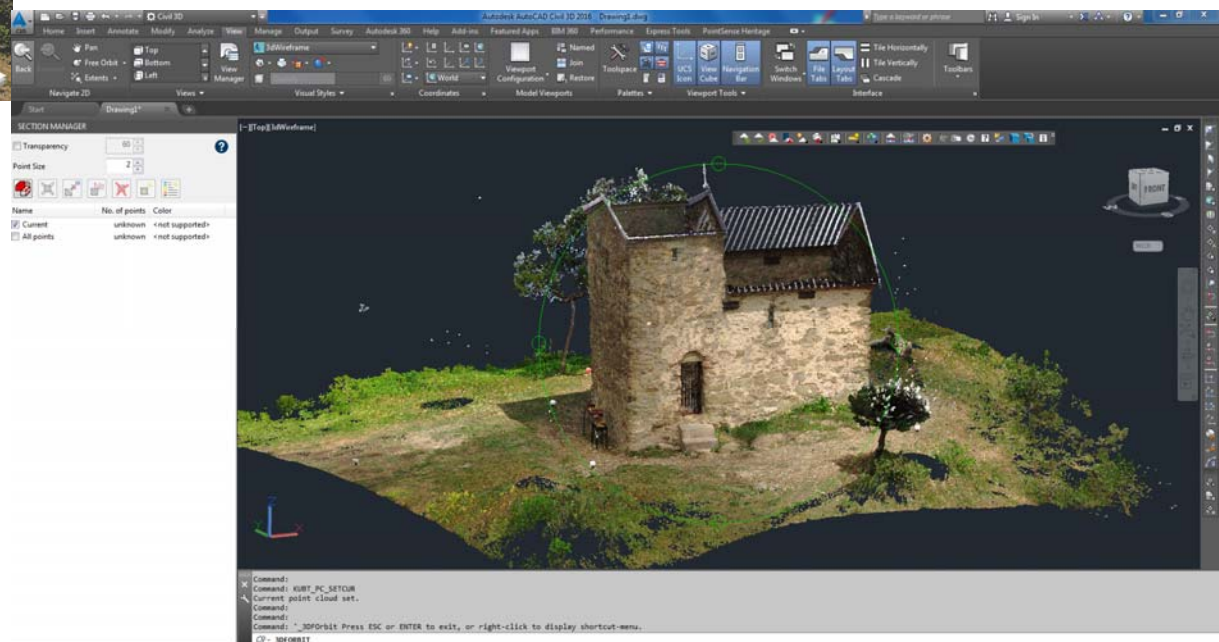
Course and materials under development in
cooperation between GTU and NACHPG





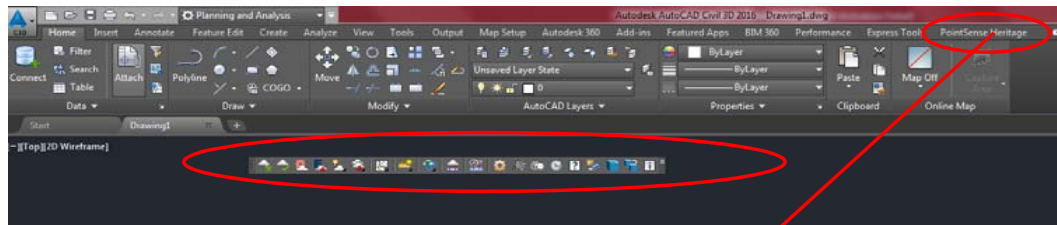


Autodesk ReCap 2016

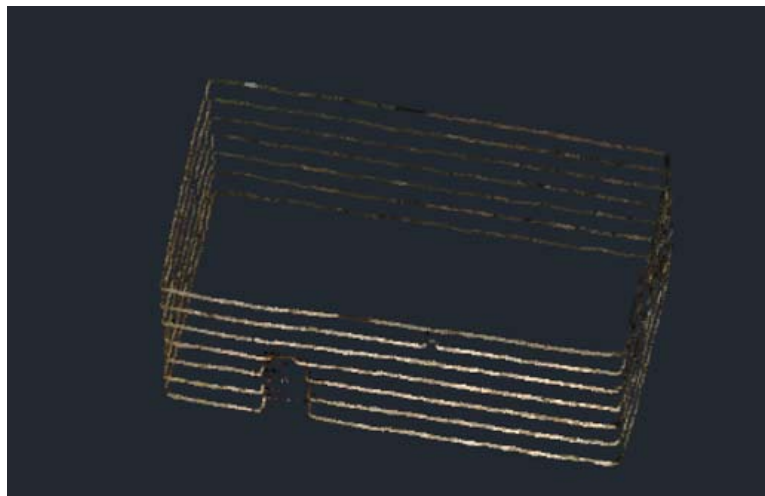
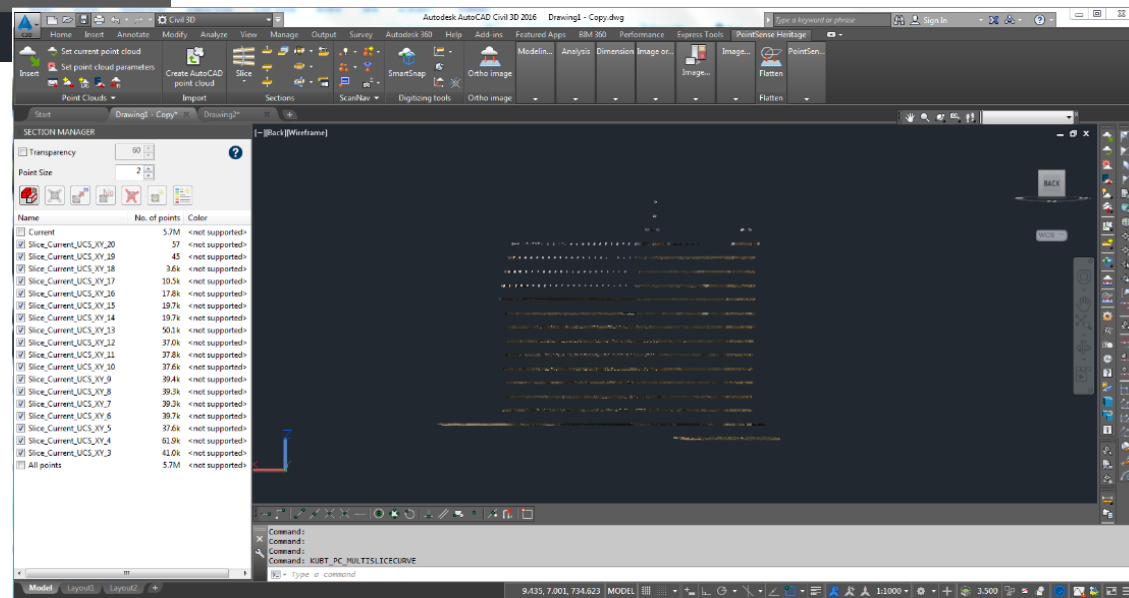


Civil 3D 2016

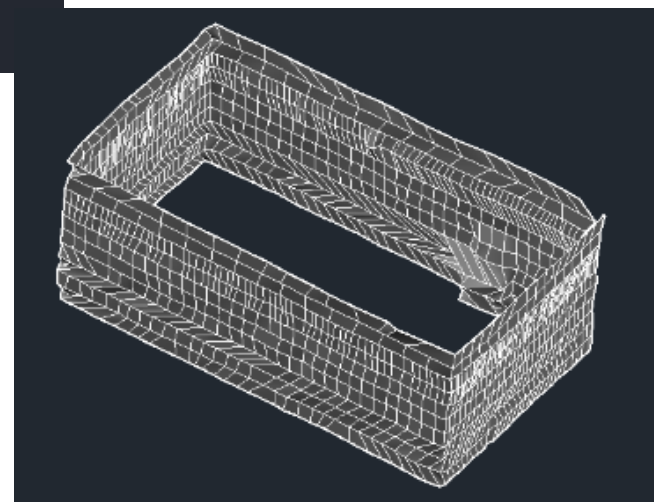
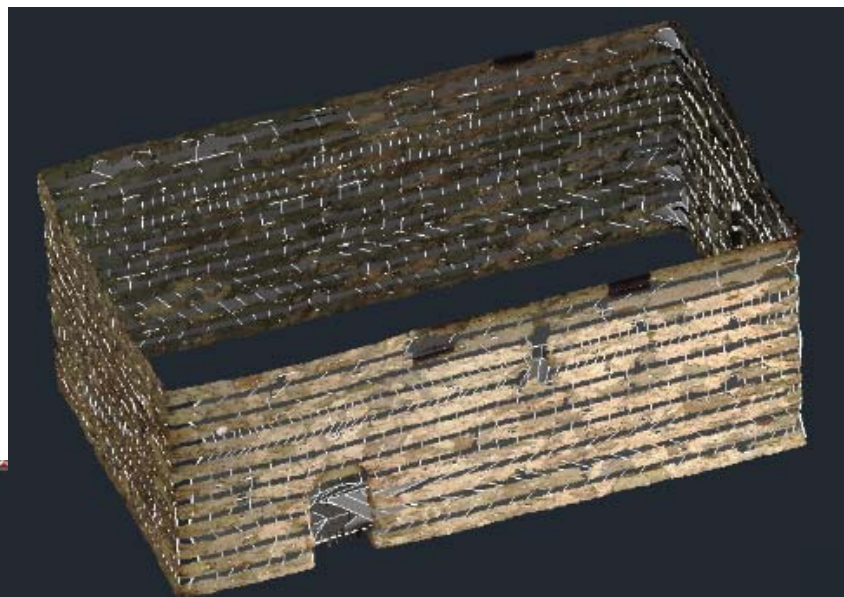
PointSense Heritage for AutoCad



Slices



Create a polygon





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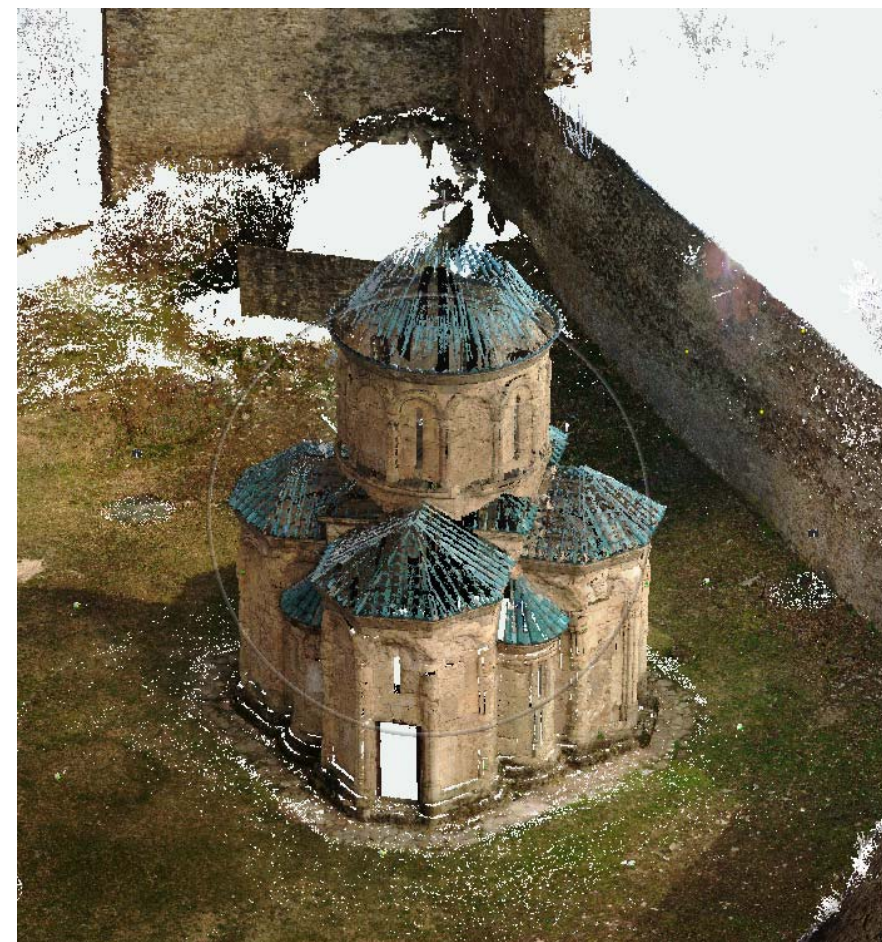


Project - Church Kvetera



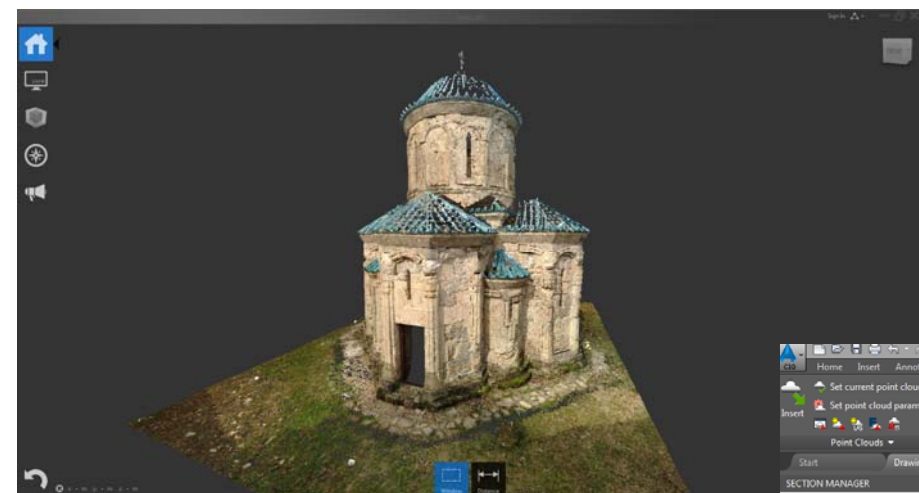
1_reg_cloud

- Scans
 - AutoCluster
 - Scan_022
 - Scan_023
 - Scan_024
 - Scan_025
 - Scan_026
 - Scan_027
 - Scan_028
 - Scan_029



Autodesk ReCap 2016

Civil 3D 2016



Slices



Name	No. of points	Color
Slice_Current_UCS_...	16.5k	<not supported>
Slice_Current_UCS_...	17.5k	<not supported>
Slice_Current_UCS_...	18.5k	<not supported>
Slice_Current_UCS_...	18.9k	<not supported>
Slice_Current_UCS_...	20.4k	<not supported>
Slice_Current_UCS_...	26.2k	<not supported>
Slice_Current_UCS_...	36.8k	<not supported>
Slice_Current_UCS_...	26.9k	<not supported>
Slice_Current_UCS_...	27.6k	<not supported>
Slice_Current_UCS_...	27.3k	<not supported>
Slice_Current_UCS_...	29.8k	<not supported>
Slice_Current_UCS_...	31.0k	<not supported>
Slice_Current_UCS_...	31.7k	<not supported>
Slice_Current_UCS_...	34.6k	<not supported>
Slice_Current_UCS_...	34.2k	<not supported>
Slice_Current_UCS_...	44.8k	<not supported>
Slice_Current_UCS_...	50.0k	<not supported>
Slice_Current_UCS_...	18.7k	<not supported>
Slice_Current_UCS_...	13.5k	<not supported>
Slice_Current_UCS_...	19.6k	<not supported>
Slice_Current_UCS_...	11.0k	<not supported>
Slice_Current_UCS_...	12.3k	<not supported>
Slice_Current_UCS_...	12.3k	<not supported>
Slice_Current_UCS_...	13.5k	<not supported>
Slice_Current_UCS_...	14.6k	<not supported>
Slice_Current_UCS_...	14.0k	<not supported>
Slice_Current_UCS_...	13.8k	<not supported>
Slice_Current_UCS_...	16.3k	<not supported>
Slice_Current_UCS_...	16.4k	<not supported>
Slice_Current_UCS_...	17.3k	<not supported>
Slice_Current_UCS_...	17.1k	<not supported>
Slice_Current_UCS_...	19.4k	<not supported>
Slice_Current_UCS_...	19.5k	<not supported>
Slice_Current_UCS_...	20.0k	<not supported>
All points	0.3M	<not supported>



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