Point Cloud Classification

Feature Extraction

Point Cloud to Mesh

Registration

Measurement
**Point Cloud Classification:**

VRMesh automatically classifies vegetation, building roofs, and ground points in LiDAR data or from UAV images. The program has unique features for classifying point clouds under extreme variations in terrain, no matter the data is gathered from steep slopes covered with dense vegetation or areas where there is very few ground points available.

![Images of Airborne LiDAR, Mobile LiDAR, and UAV Images](image)

**Feature Extraction:**

VRMesh can automatically extract building footprints, powerlines, railways, poles, and tree crowns in point clouds. It also provides automatic edge and corner detection allowing you to quickly pick a line along a chosen ridge, ditch, railway, powerline, road markings, etc.

![Images of Extracting Powerlines/Railways, Extracting Tree Crowns, and Picking Ridge](image)

**Construction:**

VRMesh not only lets you easily extract a clean surface from noisy point clouds, but also allows you to automatically fit polygon surfaces and create breaklines on point clouds.

![Images of Extracting Surface, Fitting Curbs, and Fitting Profiles](image)
Point Cloud to Mesh & Mesh Editing:
VRMesh provides best-in-class point cloud processing and various mesh repair/editing tools. It enables you to convert point clouds to triangle meshes with high accuracy. It also allows you to seamlessly merge multiple surfaces and optimize your designs in many ways.

Registration:
The registration functions in VRMesh work on both point clouds and meshes by searching for overlapping regions for each pair of clouds/meshes and best-fit mapping overlapping regions to minimize registration errors.

Inspection & Measurement:
VRMesh provides various analysis tools that help you perform accurate inspections between digital reference models and measure points, distances, areas, volumes, and deviations easily.
OVERVIEW

Welcome! VRMesh is an advanced 3D point cloud and mesh processing software tool. Our innovative technologies are aimed to provide powerful and easy solutions for engineering industries. The entire family of VRMesh consists of three packages targeted to different customers.

VRMesh Family:

- **VRMesh Studio**: An advanced solution covering a comprehensive workflow from automatic point cloud classification, feature extraction to accurate surface mesh generation. It includes all features in VRMesh.
- **VRMesh Survey**: An automatic point cloud classification and feature extraction solution. It enables you to easily classify vegetation, building roofs, and ground points in LiDAR data or from images. It can automatically detect building footprints, powerlines, poles, tree crowns, curbs and railway tracks in point clouds. It is also able to adjust airborne/mobile LiDAR strips with high accuracy.
- **VRMesh Reverse**: A complete reverse engineering workflow for users to wrap point cloud data into accurate polygon meshes as well as NURBS surfaces. It delivers best-in-class point cloud processing tools and various mesh repair/editing tools. It also provides you automatic registration, inspection, volume calculation, and deviation measurement tools.

Feature Comparison:

<table>
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<th>VRMesh Features</th>
<th>Reverse</th>
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<th>Studio</th>
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<tbody>
<tr>
<td>Point Cloud Classification</td>
<td>★</td>
<td>★</td>
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<td>Feature Extraction</td>
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<td>LiDAR Strip Adjustment</td>
<td>★</td>
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<tr>
<td>Point Cloud to Mesh</td>
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<td>Mesh Repair &amp; Editing</td>
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<td>★</td>
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<td>Digital Clay &amp; Color Marks</td>
<td>★</td>
<td>★</td>
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<tr>
<td>NURBS</td>
<td>★</td>
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<td>★</td>
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<tr>
<td>Inspection &amp; Measurement</td>
<td>★</td>
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<td>★</td>
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<tr>
<td>Construction Tools</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
</tbody>
</table>

File Formats:

- Import: e57, las, laz, zlas, ptx, pts, txt, asc, xyz, stl, obj, dxf, shp, ply, 3ds, fis, zfs, rdbx, wrl, vtk, csv
- Export: las, laz, zlas, pts, txt, asc, stl, obj, igs, dxf, fbx, shp, grid, wrl, ply, vtk, csv, x3d, pdf

Data Handling:

- No limit concerning the point cloud and mesh size
- Support batch processing of multiple files