**Potree Viewer User Guide**

Potree Viewer

* a point cloud viewer enabling exploration and measurement of large LIDAR datasets
* designed to be efficient in a web browser

Actions

* Use Potree Converter to convert point cloud data to a format compatible with PV

**How to View Data**

* *Double Click*- sets center of rotation and zooms into that point.
* *Left Click*, hold, and move mouse, rotates the view
* *Middle Scroll Wheel* – Zooms in and out
* *Right Click, hold, and move* mouse pans in the scene

**Appearance**

**Point Budget**

The point budget limits the number of points loaded and rendered at any given time, which helps to adapt performance requirements to the capabilities of different hardware. Recommended values are between 500.000 and 10.000.000.

**Field of View**

To control model elements to be included within the scene the field of view can be adjusted. Default value is set to 55 degrees.

A screenshot of a computer

Description automatically generated with low confidence

**Eye Dome-lighting**

The Potree Point Cloud 3d viewer module can implement eye dome-lighting, a lighting model that highlights the shapes of objects.

Eye Dome-lighting group objects, shade their outlines and enhances depth perception in scientific visualization images. It is useful for recognition and measurement of structures within a model. It can be modified by adjusting Radius, Strength, and Opacity.

By default, Eye Dome-Lighting is enabled on Potree 3D viewer, but it can be disabled by clicking on the enable option.

**Background**

Potree 3D viewed background can be modified with following available options:

* Street Map
* Skybox
* Gradient
* Black and white

**Splat Quality**

Splat quality can be adjusted to standard or high quality, to improve the appearance of the model.

High quality will give you the best viewing experience on your computer. If you are on a smart phone, you can keep the settings at standard quality. It may be a good idea to move the point budget down to about 5 million to keep your phone running smoothly.

Min node size - impacts the point density of the nodes represented.

Box - Displays the boxes of the nodes.

Lock view - Lock the point cloud view, preventing to load or unload points to the model.

**Tools**

**Measurement**

Potree 3D viewer module provides several tools for measurement. This tool set consist of 12 elements. It also has controls for showing or hiding the resulting measurement labels.

Measurements are performed by left clicking on the desired points and for some tools right clicking is needed to terminate the process.

Graphical user interface, text

Description automatically generated with medium confidence

**Angle**

This tool measures the tridimensional angle formed by the lines connecting 3 points. To start a measurement, click on the angle icon, then left click on 3 point and the process will be automatically ended.

**Point**

This tool highlights a selected point and display its XYZ coordinate. To start a measurement, click on the point icon, then click on the desired point and the process will be automatically ended.

**Distance**

This tool measures the tridimensional distance of the lines connecting a series of points. To start a measurement, click on the distance icon and start clicking on the desired points (two or more). Right click to finish measurement.

Further information such as total length can also be obtained from selecting this under the scene section.

**Height**

This tool measures the height or vertical distance between two points. To start a measurement, click on the height icon and then click on the desired two points. The process will be automatically ended.

Further information can also be obtained from selecting this element under the scene section.

**Circle**

This tool measures the radius of a circle formed by three points. To start a measurement, click on the circle icon and then click on the desired two points. The process will be automatically ended.

Further information such as Circumference can also be obtained from selecting this element under the scene section.

**Azimuth**

This tool measures the azimuthal angle of a line. This line is formed by two points selected by the user, the angle is measured in degrees, clockwise from 0 to 360 and starting from the geographical north. To start a measurement, click on the azimuth icon and then click on the desired two points. The process will be automatically ended.

Diagram

Description automatically generated

Further information can also be obtained from selecting this element under the scene section.

**Area**

This tool measures the horizontal area formed by a polygon. To start a measurement, click on the area icon and start clicking on the points forming the desired polygon (three or more). Right click to finish measurement.

Further information can also be obtained from selecting this element under the scene section.

**Volume (cube)**

This tool measures the volume formed by a cube. To start a measurement, click on the volume (cube) icon and click on the model to place the cube. It is possible to relocate, rescale and rotate the cube using the displayed handlers. Right click to finish measurement.

Further information can also be obtained from selecting this element under the scene section.

**Volume (sphere)**

This tool measures the volume formed by a sphere. To start a measurement, click on the volume (sphere) icon and click on the model to place the sphere. It is possible to relocate, rescale and rotate the sphere using the displayed handlers. Right click to finish measurement.

Further information can also be obtained from selecting this element under the scene section.

**Height profile**

The tool icon that looks like a multicolored M

This tool creates a height profile formed by a line on the model. To start a measurement, click on the Height profile icon and then form a line on the model by clicking on the desired points (two or more).

When you hover the mouse over the point cloud data, you should now see a red ball attached to your mouse cursor. This allows you to drop nodes and establish the location of your profile. When you want to finalize your profile, double click on the last node. Once a profile is finalized, you can still change its location by clicking on the red nodes and dragging them to a different location.

Further information and options, such as "Show 2d Profile", can also been obtained from selecting this element under the scene section.

A profile of the lidar data should now be visible at the bottom of the screen. The profile will also update in real time if you move the profile throughout the data.

The save button in the upper right corner of the profile window will download a las file containing the points from the profile. This is useful for extracting the data you want to use for further analysis.

**Annotation**

This tool creates an annotation label on a highlighted point on the model. To start a measurement, click on the annotation icon and then click on the desired point. The process will be automatically ended. To edit the annotation, select this element under the scene section, then edit Title and Description.

**Remove measurements**

This tool removes all measurements on the model. To remove all measurement, click on the "Remove measurements" icon.

**Clipping**

Point cloud can be clipped by selecting an area. Clipping options include None / Highlight / Inside /outside

To clip a point cloud, click on the volume clip icon, place the cube on the model and relocate, rescale, and rotate to contain the desired area. Highlight is set by default as the clipping method.

If only the points contained within the cube needs to be displayed, click on "Inside", otherwise click on "Outside".

To remove the clipping volume or polygons, click on the "Remove all measurements" icon.

**Navigation**

Potree 3D viewer have 4 Navigation controls which define its behavior.

**Earth Control**

Earth control navigated as anchored to the ground. Mouse left button moves the model horizontally, mouse wheel controls zoom, and right button orbits the model.

**Fly control**

Fly control moves the camera as in birds eye using the keyboard. Keys "W" and "S" moves forward and backwards, respectively and in the direction of the camera, while "A" and "D" moves left and right respectively. Also, the "R" and "F" keys moves the camera up and down. The mouse left button changes the direction of the camera, mouse wheel controls zoom, and right button moves the camera in the XYZ axis.

The speed for these movements can be controlled using the sliding control.

**Helicopter control**

Helicopter control moves the camera as in an aircraft using the keyboard. Keys "W" and "S" moves forward and backwards, respectively restricted in a horizontal plane, while "A" and "D" moves left and right respectively. Also, the "R" and "F" keys moves the camera up and down. The mouse left button changes the direction of the camera, mouse wheel controls zoom, and right button moves the model in the XY axis.

The speed for these movements can be controlled using the sliding control.

**Orbit Control**

Orbit Control is the default navigation behavior. The mouse left button orbits the model, the wheel controls zoom, and the right button moves the model in the XYZ axis.

**Full extent**

Full extent button restores the model view.

**Navigation cube**

Navigation cube displays a wireframe cube containing the model.

**Compass**

Compass button displays a compass on the upper right corner.

**Camera animation**

The camera animation button - creates animation path.

Points on green line – defines position of camera

Point on blue line – defines direction the camera is intended to be facing

To create an animation, adjust the points for the camera locations and camera direction, then select the camera element under the Scene section to create more point, change animation speed or play the animation.

**Scene**

The Scene section displays a file tree containing all the scene elements. Elements are arranged in six groups, which are **Point clouds** / **Measurements** / **Annotations** / **Other** / **Vector** / **Images**

Each element within these groups has subtrees that can be selected to get more information and control its properties.

For instance, point clouds properties can be modified to show elevation and the color ramp can be customized.

Videos or photos needed to be added

Graphical user interface

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Web Interface

Information bar

Information bar is displayed on the right side of the screen. The Top bar is the information about the county followed by Municipality name. Number denotes the dataset name. The other information available are time stamp, the number of points and the total length of the dataset.

360Images

360 Images

A 360 -degree phot is a controllable panoramic image that surrounds the original point from which the shot was taken.