3DUserNet
Empowering the 3D World

SUPPORTED FILE TYPES

3DUserNet supports both point cloud and 3D model data that can both be uploaded and converted to work inside the web applications 3D Viewer. To make sure you get the most out of your data and your 3DUserNet experience we have compiled some useful information below to help.

UPLOAD LIMITS

To make files more reliable to upload and convert we have imposed a per file upload limit for any uploads. These limits are:

Point clouds: 10GB (Gigabytes) per file

Models: 64MB (Megabytes) per file

These limits are in constant review and may be increased or decreased to ensure everyone gets a good experience. If you do have very large datasets that you want to upload and cannot separate into smaller parts then please let us know at support@3dusernet.com and we will make arrangements to help you out.

FILE TYPES

The lists below give the currently supported file types and their versions, where relevant. We have found that certain software may implement file exports less stringently than others, so you may experience failed conversions on our servers if they encounter an unusual file formatting. However, the open source software Cloud Compare (http://www.danielgm.net/cc/) is a reliable source of conversion into many of the formats that we support, so please use this to save your files before uploading them if you experience any problems.

POINT CLOUDS

File Type	Types	Version
.las (Recommended)	Binary	1.2
.laz	Binary	1.2
.xyz	Ascii	
.ply	Binary & Ascii	
.e57	Binary & Ascii	

.LAS (Recommended)

Currently we only support the version 1.2 las files that have been a stable version of LAS for several years. This is a popular and well established file format available from most vendors.

'The LAS file format is a public file format for the interchange of 3-dimensional point cloud data data between data users. Although developed primarily for exchange of lidar point cloud data, this format supports the exchange of any 3-dimensional x,y,z tuplet.' (Source: https://www.asprs.org).

One additional benefit of the LAS format is that it allows you to classify data that will show up as different coloured point cloud regions in the 3D viewer.

For uploading to 3DUserNet it is advised to have your data in a cartesian based coordinate system to achieve correct placement of data points, as other coordinate systems are not fully supported yet.

.LAZ

LAZ files are compressed versions of LAS files and are very effective for lossless transfer of data. We recommend using this format for any LAS files you may have, as it will dramatically improve your upload speed.

'LASzip is a compression library that was developed by Martin Isenburg for compressing ASPRS LAS format data in his LAStools. LASzip is completely lossless. It compresses bulky LAS files into compact LAZ files that are only 7-20 percent of the original size, accurately preserving every single bit.' (Source: http://www.laszip.org)

.XYZ

XYZ is a standard format for point cloud data exchange and usually consists of cartesian coordinates (X,Y,Z), and intensity value (I) and colour information (R,G,B). Our converter needs to know the format of this type of file to ensure you get the correct outcome. So it is required to specify if the file is XYZIRGB, or XYZRGBI ordered.

The files are human readable text files and should be **space delimited** (i.e have spaces between columns of information rather than commas etc). Also, be careful to ensure that

you do not have additional columns of data such as Normals or other scalars, as this may cause the conversion to fail. There should be a maximum of 7 columns.

Files should start with the first point in the series so that there is no header lines to the text file.

.PLY

'PLY is a computer file format known as the Polygon File Format or the Stanford Triangle Format'. (Source: https://en.wikipedia.org/wiki/PLY_(file_format))

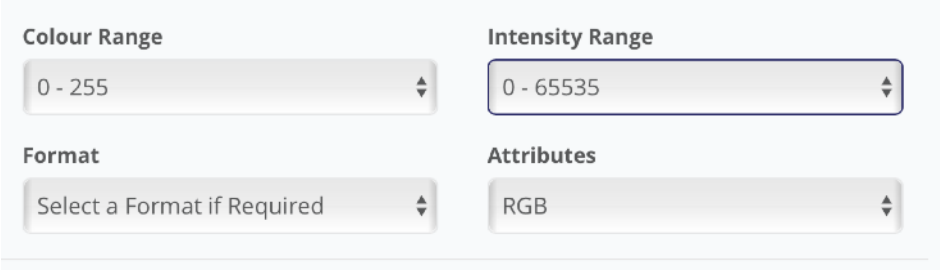
The PLY format was designed primarily for storing polygon surface data but also has the capacity to store point data retaining colour information. Both binary and ascii form of PLY file can be uploaded and converted on our platform. However, PLY has many different implementations and so we recommend using Cloud Compare to create the PLY files to maximise the chance of successful conversion.

.E57

This file type is the ASTM 57 3D Imaging Data Exchange format. It was designed as a general purpose open standard that could be used for consistently sharing 3D data. It has become an increasingly popular format that can be exported by many softwares handling point cloud data.

Upload Settings

There are various upload settings for point cloud files that can be applied as required.



Colour Range relates to the scaling used for the colour attributes of your file. This can be between 0-255 / 0-1 / 0-65535.

Intensity Range is the scaling on the intensity values and can be set to 0-1 / 0-65535

Format is for xyz files that may have their columns in different orders. You can choose between XYZIRGB / XYZRGBI

Attributes relates to what information you want to be converted in the file. You can choose combinations of RGB (Colour), Intensity, or Classification. Classification is defined in .las and .laz files and colours different parts of the point cloud based on object type.

3D MODELS

File Type	Types	Comments
.obj	Ascii	Geometry Only - No Textures
.stl	Binary	Geometry Only - No Textures
.ply	Binary & Ascii	Geometry Only - No Textures
.zip		Contains OBJ file with Textures

.OBJ / .STL / .PLY

These three file types are intended only to support geometry in the form of polygonal meshes and surfaces. If the files contain other forms of geometry they will likely fail to convert. Also colour, or per vertex colour is not currently supported either, so please remove any colour from your models prior to upload.

Currently, the models will come into the 3D viewer with a grey colour. It is our intention to add custom colour changing to models in future versions of the application.

.ZIP (Textured OBJ Files)

The purpose of the .ZIP file format is to allow upload of .OBJ files that have associated texture files that may be held in sub directories. The formatting of the file structure needs to be consistent with the description below otherwise the conversion may fail to bring the textures in correctly.

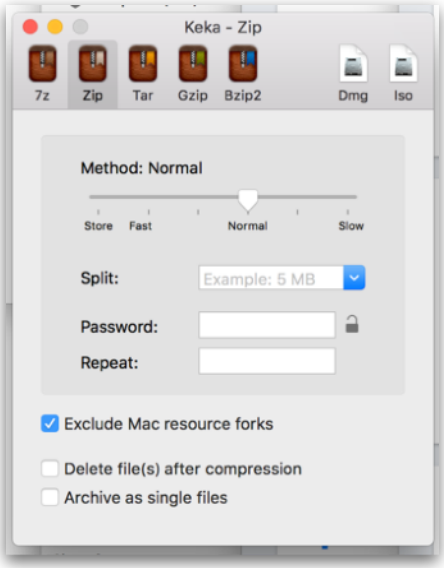
The zip file should contain:

.OBJ file

.MTL file

Texture images (or a subfolder/s that include the textured images)

It is crucial that the .MTL file references the textures correctly (i.e references the subfolders if required) otherwise the converter will not find the textures and your model will appear completely black.



Important: When creating a **zip** file on MAC OSX please ensure that the hidden files (mac resource forks) are not included as this causes the conversion to fail. To avoid this happening we recommend using an archive program called **Keka** (http://www.kekaosx.com/en/) and checking the 'Exclude Mac Resource Forks' box when creating your zip file.

OPTIMISING YOUR DATA

Like any software application 3DUserNet works at its best when the data you upload has been optimised for the purpose. To perform some of these optimisations you can use your registration or modelling software package or perhaps try an open source software such as Cloud Compare (http://www.danielgm.net/cc/) that has a number of functions that can reduce and optimise point cloud data and Meshlab (http://www.meshlab.net) that can handle 3D models in a variety of formats.

Well here are some suggestions for both types of data we support:

POINT CLOUDS

It is helpful to have structured point clouds that have an even distribution of points. This reduces the number of overlapping points and therefore reduces the loading time for the points in your browser. A good way of producing this type of optimised point cloud is to use a uniform filter and specify a suitable point spacing for the filter. Typically with terrestrial laser scanners settings of between 1 and 5 millimetres works well, but really you have to decide on this point spacing based on your specific dataset.

3D MODELS

The most resource hungry aspects of 3D models are the number of polygons they contain and the resolution of their textures. If a model has many thousands of polygons and high resolution textures then they will take longer to convert and also will reduce viewing performance in your browser.

We recommend optimising your models by reducing unnecessary polygon density. You can do this manually through your modelling software or use specialist software packages to decimate your models polygon density without reducing the overall accuracy or quality of the model.

Secondly, any textures should be reduced to a resolution that provides the required amount of detail without having unnecessary pixel density. For example for most purposes when viewing on a computer screen a texture that is 2048 x 2048 pixels may not provide much more detail than a texture at 1024 x 1024 pixels, but the improved performance of using the smaller texture would greatly enhance the benefit to the end user.

Feedback

We really want to make 3DUserNet *the* place to work on and share 3D data, so if you have any problems, queries or ideas please don't hesitate to contact us:
support@3dusernet.com