

Preparing Objects for Bryce using MeshLab

Bryce can import many different object formats directly. But not all and some are just too detailed and have a file size Bryce cannot handle anymore. Such objects have to be reduced in resolution.

Preamble

There are a couple of beautiful mesh objects from real models that were scanned three-dimensional by the *Stanford Computer Graphics Laboratory* and are freely available for download from the *Stanford 3D Scanning Repository*:

<http://graphics.stanford.edu/data/3Dscanrep/>.

If you download and use these models, please read carefully at least the paragraphs *Please acknowledge...* and *Inappropriate uses of these models*. The models are available in the PLY file format which Bryce cannot read.

This small tutorial uses MeshLab to do the file format conversion and the mesh reduction. The program is free and can be downloaded from <http://meshlab.sourceforge.net/> for the PC.

The tutorial is based on information generously given by *LordHardDriven* in the DAZ 3D Bryce Forums and my own endeavours. Thank you Mark!

MeshLab

It is assumed that MeshLab is installed and PLY files from the *Stanford 3D Scanning Repository* are used, though MeshLab can handle a lot of different file formats. The best “bet” for Bryce is using the Wavefront OBJ format.

PLY and OBJ File Formats

The Stanford Polygon File Format PLY files are ascii files and their file size is about half of a Wavefront Object OBJ file, which is also an ascii file.

bun_zipper01.ply

```
ply
format ascii 1.0
comment zipper output
element vertex 35947
property float x
property float y
property float z
property float confidence
property float intensity
element face 69451
property list uchar int vertex_indices
end_header
-0.0378297 0.12794 0.00447467 0.850855 0.5
-0.0447794 0.128887 0.00190497 0.900159 0.5
-0.0680095 0.151244 0.0371953 0.398443 0.5
-0.00228741 0.13015 0.0232201 0.85268 0.5
-0.0226054 0.126675 0.00715587 0.675938 0.5
-0.0251078 0.125921 0.00624226 0.711533 0.5
-0.0371209 0.127449 0.0017956 0.888639 0.5
0.033213 0.112692 0.0276861 0.652757 0.5
0.0380425 0.109755 0.0161689 0.708171 0.5
-0.0255083 0.112568 0.0366767 0.454541 0.437538
-0.0245306 0.112636 0.0373469 0.448754 0.455187
0.0274031 0.12156 0.0212208 0.533079 0.5
-0.0628961 0.158419 -0.0175871 0.404517 0.5
0.0400813 0.104202 0.0221684 0.535542 0.5
0.0451532 0.0931968 0.0111604 0.579563 0.425995
-0.0324965 0.174231 -0.00238999 0.365607 0.5
-0.0804587 0.135827 0.0500319 0.499575 0.5
-0.0724944 0.126022 0.052902 0.564827 0.5
```

bun_zipper01.obj

```
####
#
# OBJ File Generated by Meshlab
#
####
# Object bun_zipper.obj
#
# Vertices: 35947
# Faces: 69451
#
####
vn 1.223420 6.106969 -0.789864
v -0.037830 0.127940 0.004475 0.498039 0.498039 0.498039
vn 1.351736 5.963559 -1.435807
v -0.044779 0.128887 0.001905 0.498039 0.498039 0.498039
vn 0.367206 5.014973 3.728925
v -0.068010 0.151244 0.037195 0.498039 0.498039 0.498039
vn -0.385074 6.089025 1.435442
v -0.002287 0.130150 0.023220 0.498039 0.498039 0.498039
vn -1.639362 6.038991 -0.564704
v -0.022605 0.126675 0.007156 0.498039 0.498039 0.498039
vn -1.262990 6.122241 -0.580414
v -0.025108 0.125921 0.006242 0.498039 0.498039 0.498039
vn 1.709938 5.964254 -0.979467
v -0.037121 0.127449 0.001796 0.498039 0.498039 0.498039
vn 4.557332 3.207902 2.899741
v 0.033213 0.112692 0.027686 0.498039 0.498039 0.498039
vn 0.000000 0.000000 0.000000
v 0.038043 0.109755 0.016169 0.498039 0.498039 0.498039
vn -2.456123 4.031157 4.120945
```

Importing, Remeshing and Exporting an Object

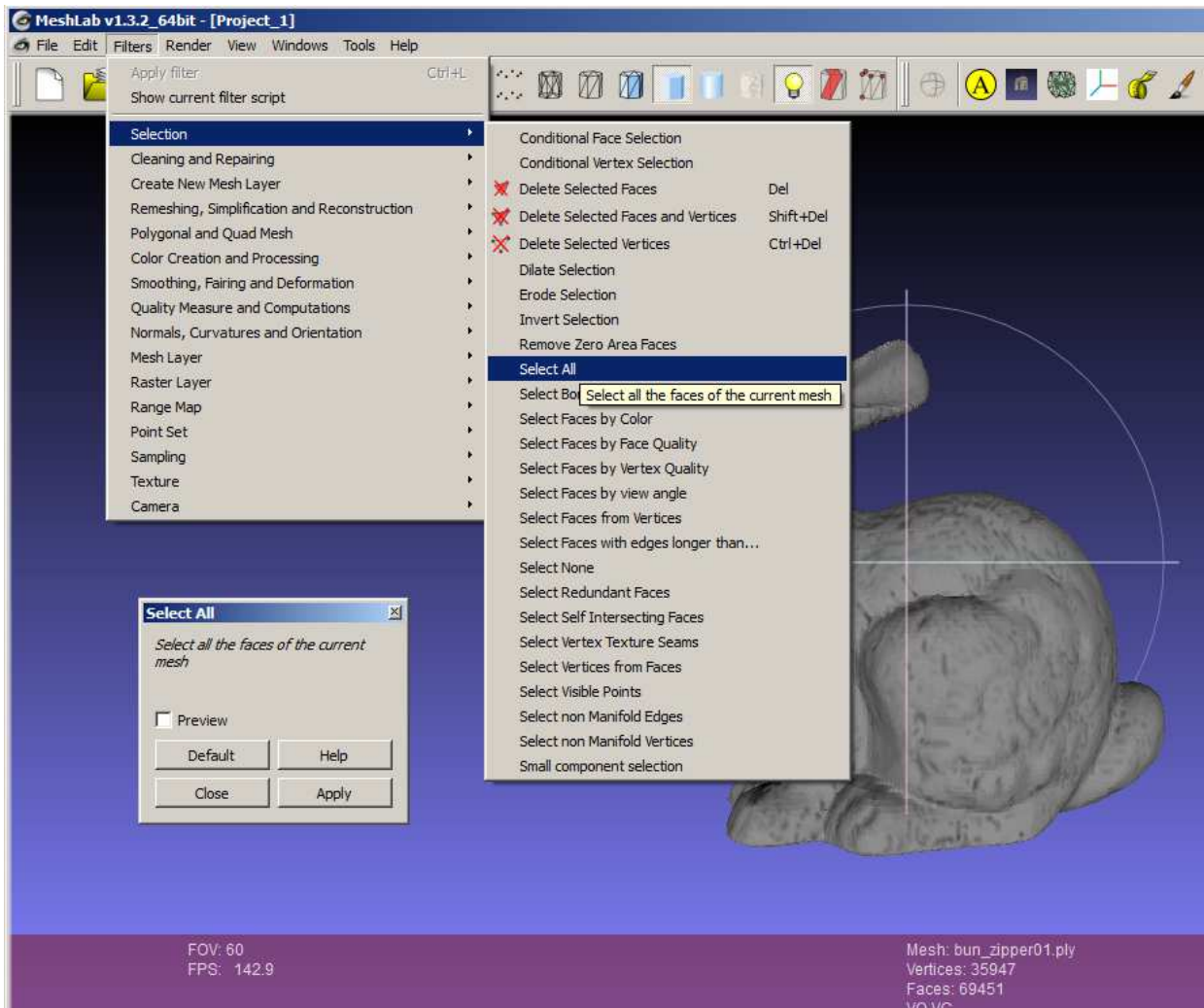
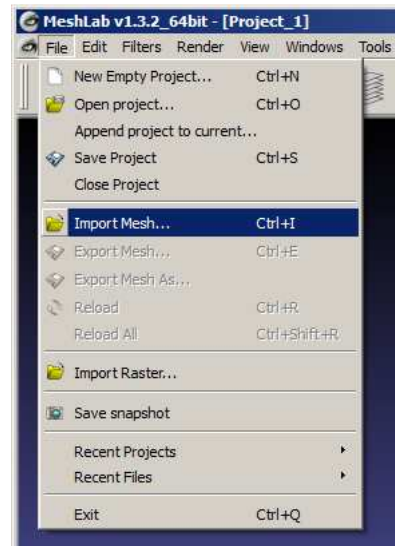
If there is already a project open, click on File > New Empty Project or hit Ctrl+N. Always start with an empty project.

To import a mesh in any format supported by MeshLab, like PLY, click on File > Import Object or hit Ctrl+I as shown at right.

The file open dialog appears and you can select the file you want to convert. Depending on its size, this will be swift or take a few seconds. At the bottom of the MeshLab window, a bar shows the progress.

Once the file is loaded, the object can be rotated and tilted and be viewed in 3D. There are many view options of which we investigate none. I do not know MeshLab intimately and out goal here is to reduce resolution and export as OBJ.

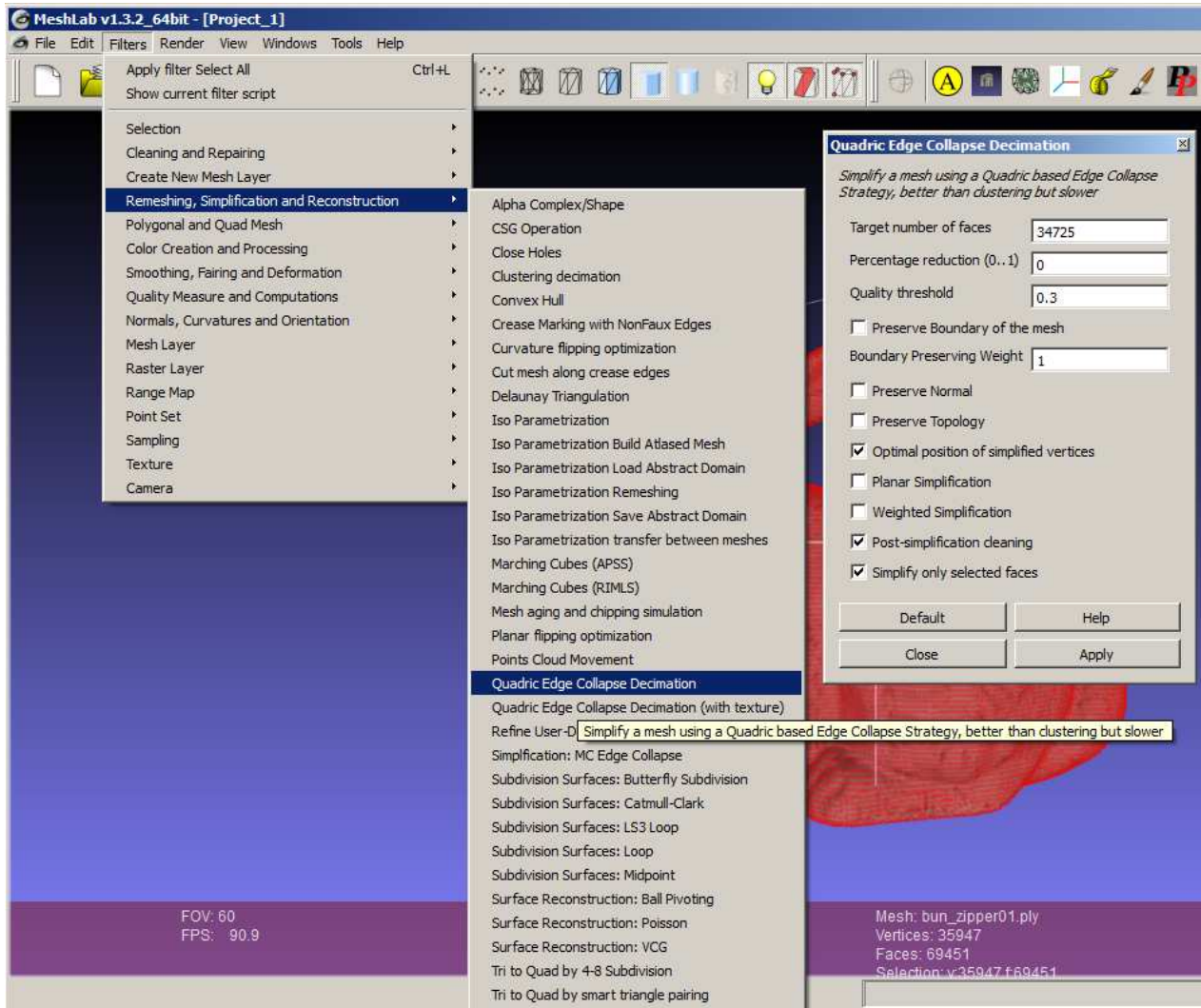
Once the object is loaded, here the bunny, we have to select everything that makes up this object. Click on Filters > Selection > Select All. It may take a moment until the second drop down appears. See picture below.



When done, the small dialog Select All appears (shown above at lower left). Just click on Apply and after a moment, the object gets almost fully red because there are so many faces and vertices.

The status line shows that the mesh bun_zipper01.ply is loaded, that it has 35,947 vertices and 69,451 faces.

Now to reduce these faces to half that amount, click on File > Filters > Remeshing, Simplification and Reconstruction > Quadratic Edge Collapse Decimation. It may take a short moment until the second drop down appears.

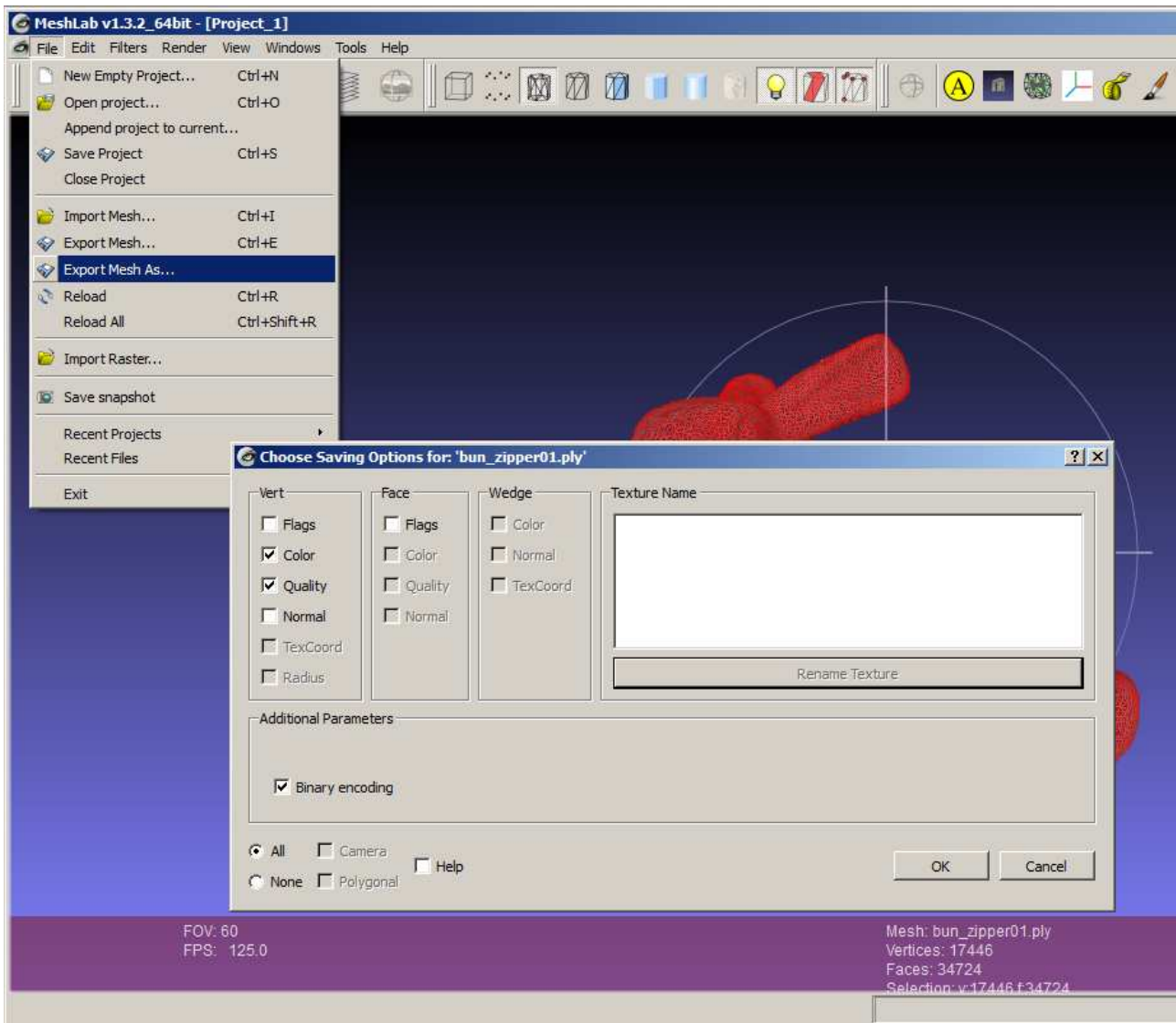


Then, the dialogue Quadratic Edge Collapse Decimation pops up. The field labelled Target number of faces shows half the number of faces indicated on the status field at the bottom. I really do not completely understand how the other parameters in the dialogue ought to be set, keeping them at the default proved to be a valid setting.

Depending on the complexity of the mesh object, the quadratic edge collapse decimation may finished in a second or two, like for the bunny, or may take several minutes. The picture above shows on the lower edge at right where the bar will appear that shows the progress of the operation.

Once the operation is concluded, you have a mesh that is only half the resolution of the original one. It is time to save it – or rather – export it. It can be exported to the target file format, OBJ in the case of Bryce, or again as PLY. If you intend to half the resolution once more, it does not matter whether you import the exported PLY or OBJ. However, it is important that you give the exported file a name that helps you to identify how much the resolution was reduced and be careful not to overwrite the original.

To export, click on File > Export Mesh As... The Save As dialog appears.



After the file has been given a name, the dialogue Choose Saving Options for “filename.typ” (here bun_zipper01.ply) pops up. The model has no texture applied and hence the default settings can be acknowledged by clicking on OK.

If you wish to further reduce the resolution, start again by opening a New Empty Project and import the exported model. Then select all and do the Quadratic Edge Collapse Decimation again, export, and so on.

Please be aware that those meshes can be quite large. I could import a mesh of 615 MB as OBJ into Bryce (xyzrgb_dragon) but could not save the Bryce file, nor could I save the object to the library. All I could do was export it as 3DS from Bryce, but that did not help matters. The 864 MB file (xyzrgb_statuette) prompted an Out of Memory error in Bryce, even though I have Bryce Large Address Aware.

This means that you may have to reduce the mesh resolution several times. In fact, I went as far as to 1/64 of the original resolution – though in steps. It depends how large the object will be rendered in Bryce and how far away it is from the camera. A low resolution model may be sufficient in one case and a high resolution one mandatory in another.

Bryce

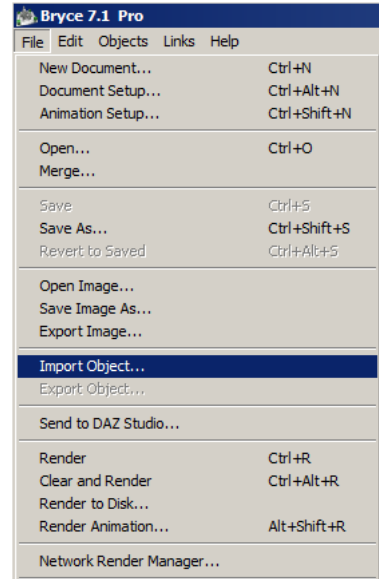
Once you have the object(s) in one or several resolution(s) in the Wavefront OBJ file format, you can use them in Bryce by importing.

Click on File > Import Object and the Open dialogue pops up. Select the mesh. The OBJ Import dialog opens. Though it comes without any material, the option Obj group material is fine.

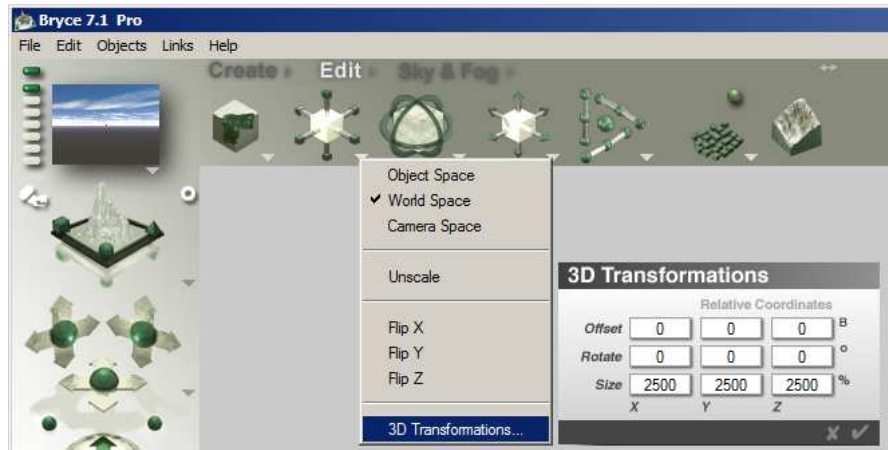


Depending on the size, it will be loaded in a second or two, or in half an hour or even longer.

The *xyzrgb_dragon* took 39 minutes to load in the full resolution; the *xyzrgb_statuette* generated the Out of Memory error after 1 hour 10 minutes. The bunny took 5 seconds at most in the full resolution.



The size in which the objects appear varies. The bunny is tiny and will have to be enlarged. Other meshes are very large and have to be reduced in size. This is best done with the Transformation tool in Bryce. Edit > 3D Transformations opens the respective dialogue.



The example above shows a size for X, Y and Z of 2,500%. This makes the bunny 25 times larger. The Armadillo had to be reduced to a fifth, i.e. to 20%.

Each model you import can be saved to the Objects Library for later use. To save the model to the Objects Library, select the object and click on the arrow right of Create. This opens the library. Navigate to sub-library and click on Add.

Bryce converts the import file format to an internal one. The object is loaded from the Objects Library faster and if a material was applied to it, the material is saved along with the object in the library.

You can add a sub-library, give the object a title and add a description.

A library must never reach 2 GB, all is lost if it does.

