Lunavast CGto3DPrint

3D CG to 3D Printable 3D model converter for Windows PC

Manual Ver. 1.0.0

Lunavast CGto3DPrint is a free software that converts 3D CG(Computer Graphics) models to 3D printable manifold 3D models using MeshLab for surface mesh to voxel conversion and Blender for baking color textures.

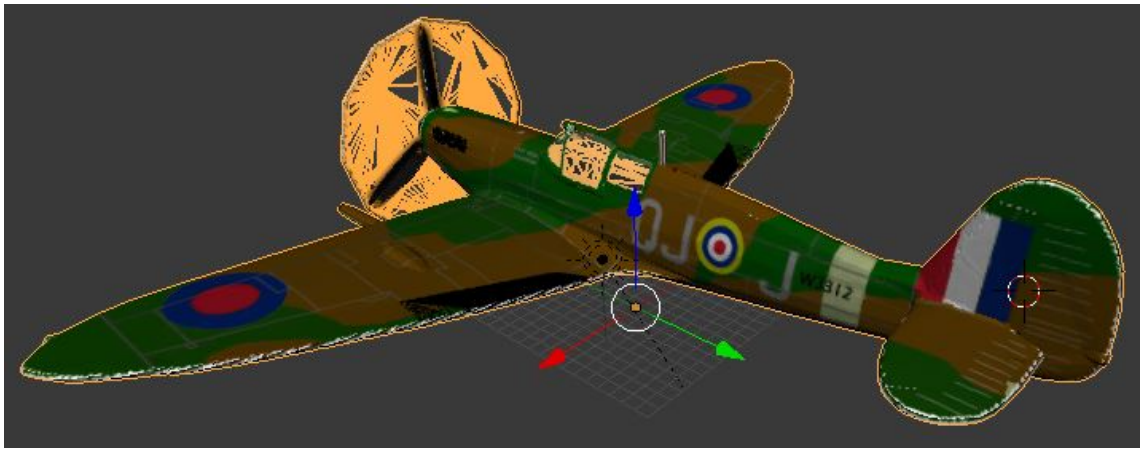
Converted 3D models are automatically exported from Blender to STL file for single color 3D Printing or manually exported to PLY file for full color 3D Printing using Lunavast CrafteHbot Full Color Printer or any other full color 3D Printers.

How CGto3DPrint works:

1. When Convert button of CGto3DPint is pressed, it exports a STL file of the selected 3D model in a Blend file.
2. The mesh of the STL file is imported to MeshLab and converted to voxels. Thin or zero thickness surface will have more thickness. (This voxel conversion with MeshLab uses a modified version of MultiMesh Scripting)
3. The voxel file is exported as another STL file and imported to Blender.
4. The surface color of the original 3D model is converted to a new texture image and it is baked to the new 3D model.
5. A manifold STL file is automatically exported. Users can manually export the new 3D Printable color model from Blender to PLY file.

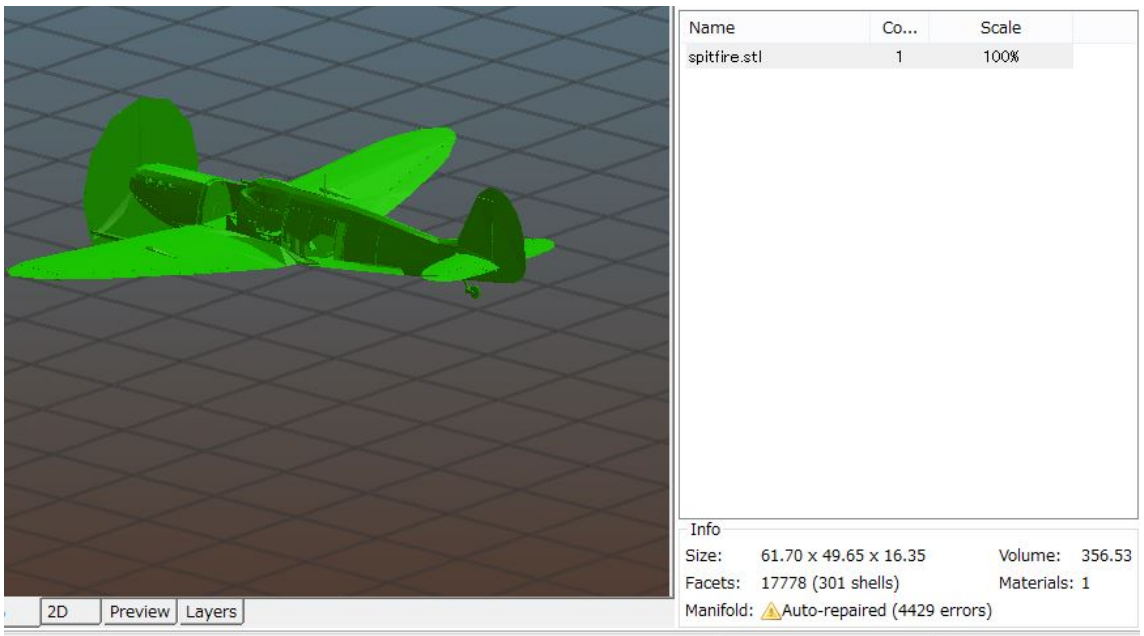
Effect of CGto3DPrint:

In a lot of cases, CGs have meshes with zero thickness or non-manifold. When such 3D models are sliced for 3D Printing, they usually fail slicing.

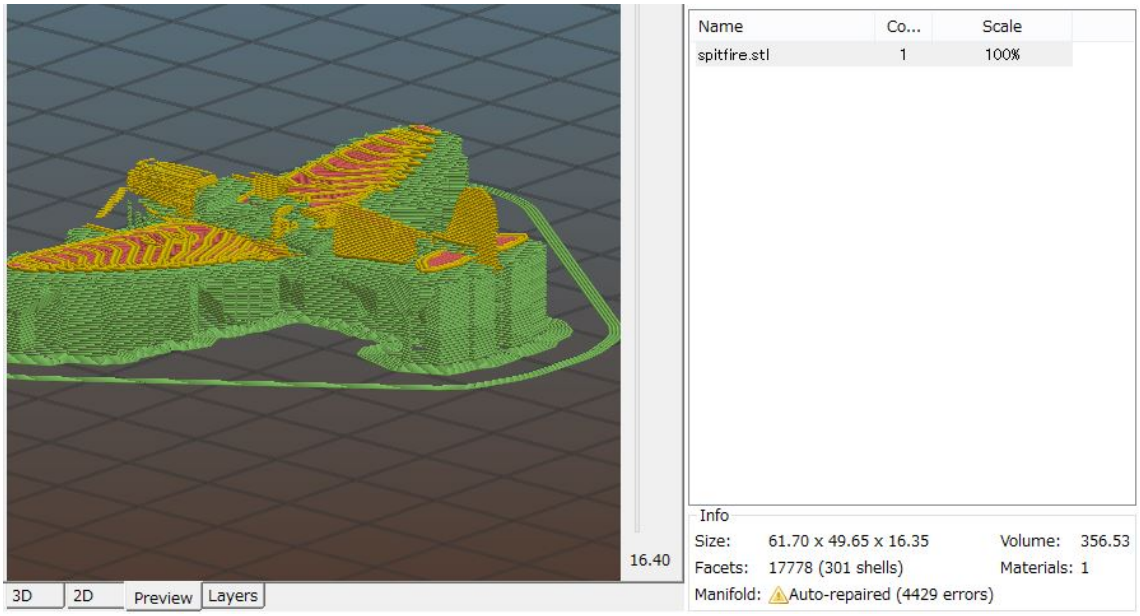


When the above 3D model of aircraft is imported to a slicing software, the slicing result is as follows.

The imported STL file has big holes on the side of its fuselage after auto repairing of the errors by the slicing software.

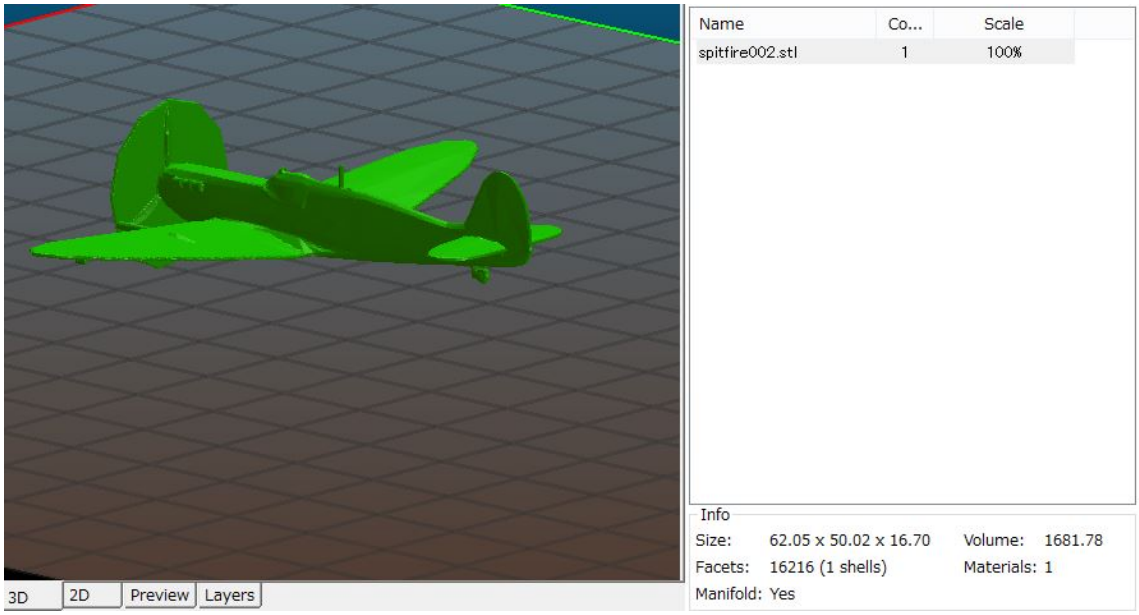


Too thin or zero thickness surface cannot be sliced properly.

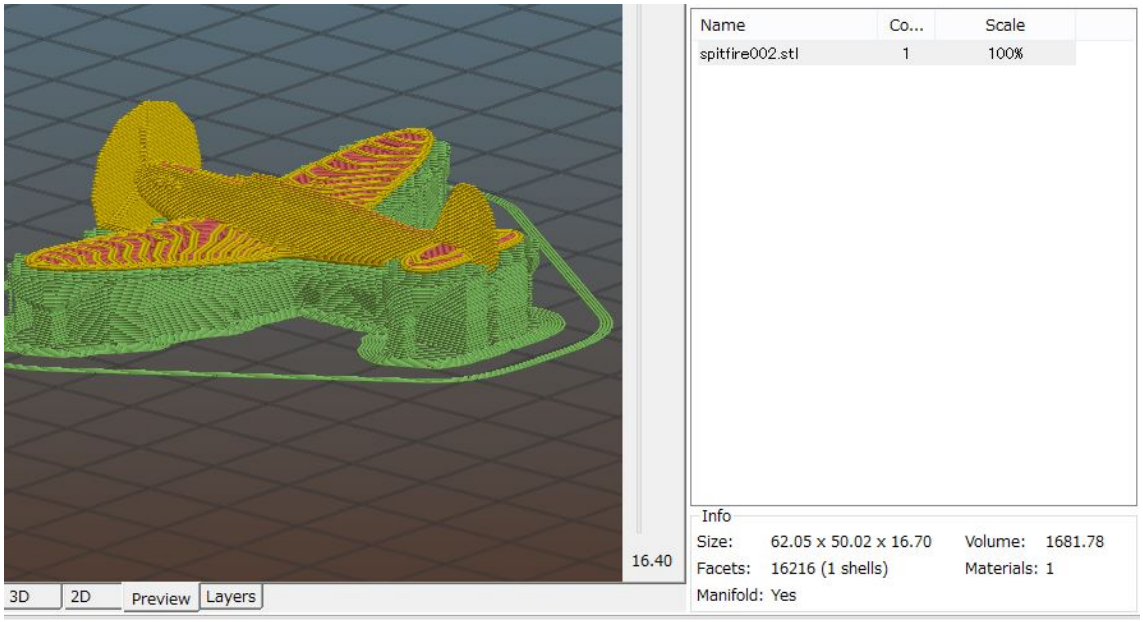


By conversion using CGto3DPrint, the converted 3D model will be as follows.

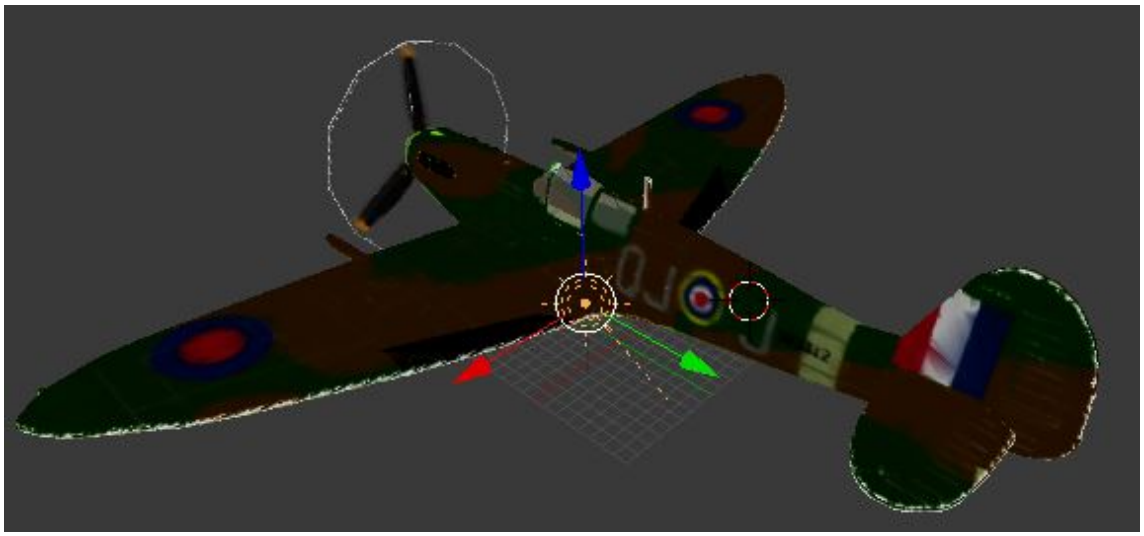
It becomes single shell, manifold model.



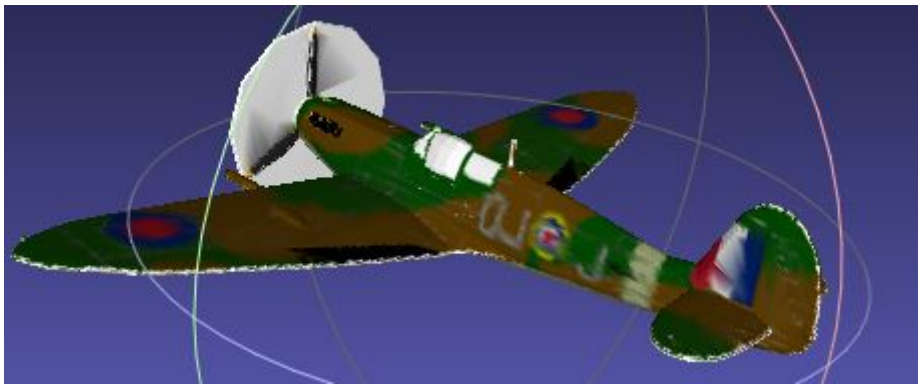
It is sliced as desired.



Converted 3D model shown in Blender.



Exported PLY file opened in MeshLab software.



How to use:

1. Settings

   1.1 Download & Install Blender https://www.blender.org/

   1.2 Download & Install MeshLab http://meshlab.sourceforge.net/

   1.3 Download & Extract Lunavast CGto3DPrint

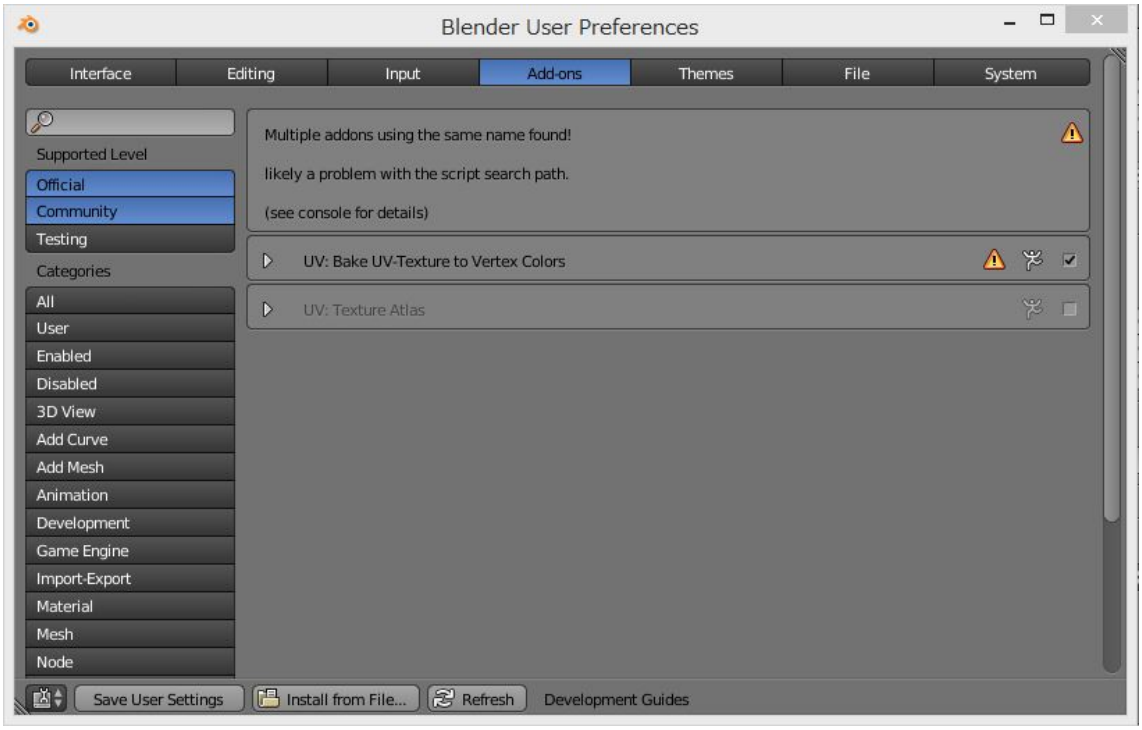
   Create a new folder and place all extracted files in **C:\CGto3DPrint**

   1.4 Check and set path of meshlabserver.exe at the top row of "CGto3DPrint.bat" file in the script folder.

   Modify the following path information if your installed path is different.

   @set meshlabserverPath="**C:\Program Files\VCG\MeshLab\meshlabserver.exe**"

1.5 Activate the plugin in Blender



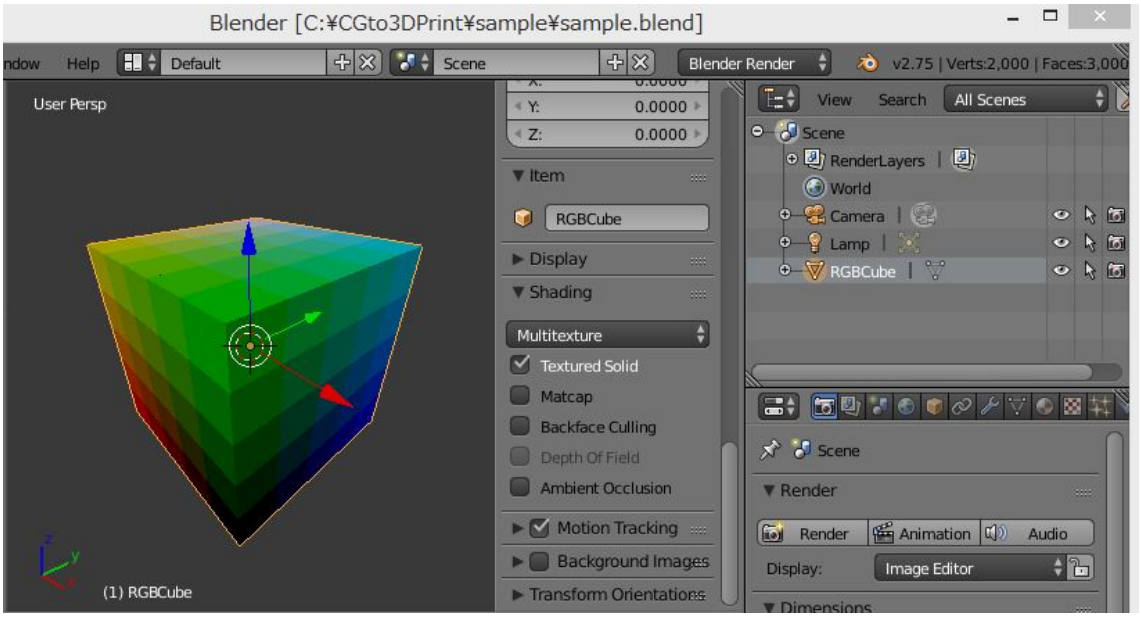
File menu > User Preferences > Add-ons > Categories – UV

Check "UV:Bake UV-Texture to Vertex Color" to enable the function.

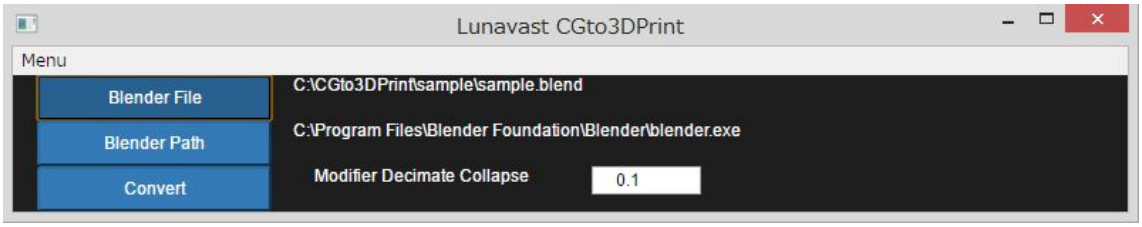
Save User Settings and close the window.

2. Open a Blender file. If the 3D model for 3D Printing is not Blender file, import it to Blender by File menu > Import.

3. Select an object for 3D Printing. Only selected object will be converted.

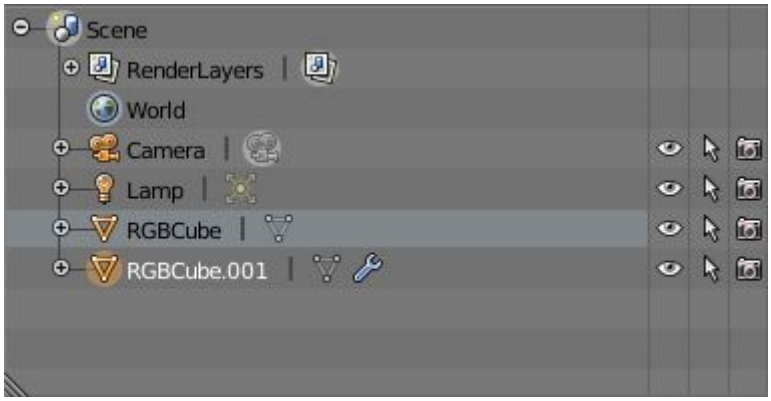


4. Save and Close the Blender file.
5. Start Lunavast CGto3DPrint by double clicking the EXE file
6. Set Blender Path for blender.exe file.
7. Set Blender File that was just closed by above step 4.
8. Set Modifier Decimate Collapse value



This value is used to reduce file size of the model after voxel conversion by MeshLab. 0.1 means the file size will be 10% of the original size. If file size is less, the quality of mesh and surface color are worse. If file size is bigger, more memory and disk space is required and takes more time for conversion.

9. Press Convert button
10. Wait until Job Completed
11. After the job is completed, a new object is created. The name of the new object is “original name.001”. A new STL file is automatically exported in the same folder as the Blender file. If you would like the color 3D model, select the object. Then, export it by File menu > Export > Stanford (.ply).



12. Advanced setting

Modifier Decimate Collapse changes file size of voxel converted mesh after re-imported to Blender.

In addition, resolution of voxel can be changed using parameter setting of MeshLab script. Surface to voxel conversion uses Uniform Mesh Resampling filter of MeshLab, which has parameters. World units of Precision and Offset define resolution of voxel. The standard 0.2 for both parameters means the voxel size is 0.2mm x 0.2mm x 0.2mm. Smaller values means higher resolution of voxel.

"CGto3DPrint.mlx" in scripts folder is the file used for voxel conversion. It is defined in the 6th row of "CGto3DPrint.bat" file in scripts folder. Additional files are included in the same folder to enable changing the setting. If you change the 6th row as follows, you can switch voxel resolution setting.

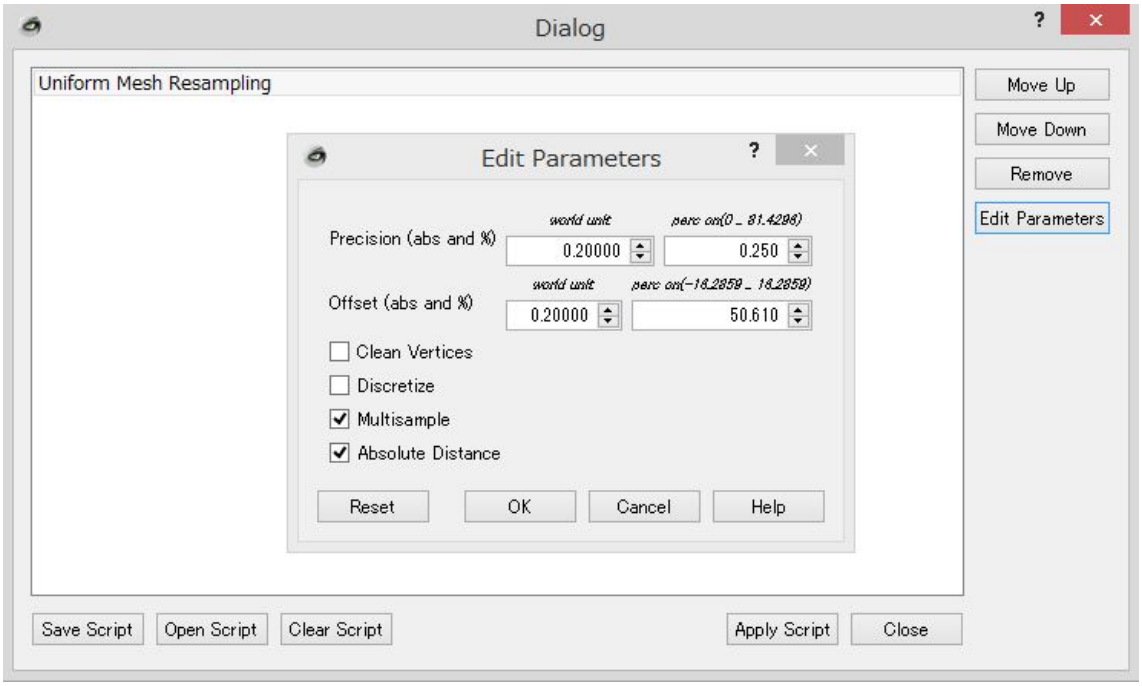
Standard setting (0.2mm) : @set mlxScriptFile=CGto3DPrint.mlx

0.2 x 0.2 x 0.2mm voxel size : @set mlxScriptFile=CGto3DPrint0.2.mlx

0.5 x 0.5 x 0.5mm voxel size : @set mlxScriptFile=CGto3DPrint0.5.mlx

MLX files can be opened and edited with MeshLab.

1. Open any 3D model file with MeshLab.
2. Filters menu > Show current filter script > Open Script
3. Select one of MLX file in scripts folder of CGto3DPrint folder.
4. Select Uniform Mesh Resampling > Edit Parameters
5. Change world unit parameters of both Precision and Offset as you like. Input the same numbers for both. Save Script with a new file name.
6. Edit the 6th row of the "CGto3DPrint.bat" for the file name.



References :

- How to 3D Print MMD data : http://junnno.sakura.ne.jp/3d/

The original concept of CGto3DPrint is automation of manual conversion procedures explained in the above website (Japanese language only).

- 3D Model : http://ux.getuploader.com/measerea_corllbland/download/75/spitfire.zip

- Blender https://www.blender.org/
- MeshLab http://meshlab.sourceforge.net/
- MultiMeshScripting https://github.com/AndrewHazelden/MultiMesh-Scripting
- Lunavast CrafteHbot Full Color 3D Printer http://lunavast.jp
- Lunavast CGto3DPrint http://3d-print.link/download/lunavast-cgto3dprint/