

PHOTOMESH – EDITING MESH GEOMETRY AND TEXTURE

After a 3D mesh model is created in Skyline PhotoMesh, certain tiles may require editing, e.g. to remove a particular building that is being torn down, or to flatten surfaces and correct certain imperfections such as floating components (e.g. electric lines, lamp poles), bumps or irregular surfaces. These edits can be performed in external software such as Autodesk[®] MeshMixer, Blender, and others, and then the tiles can be imported back into PhotoMesh in order to rebuild the project. This Quick Guide to Editing Mesh Geometry outlines the basic workflow and tools for editing mesh geometry using Autodesk[®] MeshMixer. See [PhotoMesh Tutorials #5: Editing Mesh Geometry and Texture](#) for a step-by-step video tutorial.

Workflow

Step 1: Export the model

1. On the **Home** tab, in the **Tiles** group, click **Reconstruction Tiles**.
2. Click the tile whose model you want to export. You can use CTRL-click or SHIFT-click to multi-select tiles. The Tile tab is displayed.
3. On the **Tile** tab, in the **Export** group, click **Model**. The Export Model Folder dialog box is displayed.
4. Browse to the required location, and click **Save**, keeping the original file name.

Step 2: Edit the model using MeshMixer or Blender

1. Download [Autodesk MeshMixer](#) or [Blender](#)
2. Follow the instructions for installing and opening the software.
3. Use MeshMixer to edit imperfections in the mesh model. **See:** [Editing Mesh Geometry with Autodesk[®] MeshMixer](#) and [Editing Mesh Texture with Blender v2.79](#) for more information.
4. **Export** and save the edited model keeping the original file name. When importing an exported model file back into PhotoMesh after editing in external software, the model file must have the original file name with which it was exported to enable PhotoMesh to update the respective tile based on the edited model. It is recommended to back up the original file or save it in a new folder.

Step 3: Import the edited models back to PhotoMesh

1. If you want to import a single model:
 - a. On the **Home** tab, in the **Tiles** group, click **Reconstruction Tiles**.
 - b. Click the tile for which you want to import a model. The **Tile** tab is displayed.
 - c. On the **Tile** tab, in the **Import** group, click **Model**. The Import Model dialog box is displayed.
 - d. Browse to the required model and click **Open**. The Import Model dialog box is displayed.
 - e. Select the model data to import and then click **Import**:
 - Import model and textures
 - Import only textures – use model generated in PhotoMesh
 - Import only the model – requires rebuilding from texturing
2. If you want to import multiple models:
 - a. Create a new folder and place all edited models in this folder.
 - b. On the **Home** tab, in the **Add** group, click **Import Models**. The Import Model Folder dialog box is displayed.
 - c. Browse to the required location, select the folder that contains the edited models and click **Select Folder**. The Import Model dialog box is displayed.
 - d. Select the model data to import and then click **Import**:
 - Import model and textures
 - Import only textures – use model generated in PhotoMesh
 - Import only the model – requires rebuilding from texturing

Step 4: Resume building the project

After importing, rebuild using the “Build” command starting from “Auto”, to have PhotoMesh automatically determine what processing must be performed to apply the changes to the project. Only affected tiles are rebuilt, either from the texturing step, if just models were imported, or from the output step, if both models and textures were imported.

1. On the **Home** tab, in the **Create** group, click **Build**. The Build Parameters dialog box is displayed.
2. Start from “Auto” and build until “Output”, to have PhotoMesh automatically determine what processing must be performed to complete the project. PhotoMesh Build Manager opens.
3. Select the required fusers, and then click **Build**.

Editing Mesh Geometry with Autodesk® MeshMixer

This section outlines the basic tools for editing mesh geometry. For more advanced tools, see the MeshMixer user manual and online tutorials (<http://meshmixer.com/help/>).

- [Auto Detection and Correction of Model Defects](#)
- [Discarding Specific Faces of the Model and Filling Holes](#)
- [Smoothing Bumps or Bubbles in the Model](#)
- [Flattening an Area](#)
- [Reducing the Number of Triangles in an Area](#)

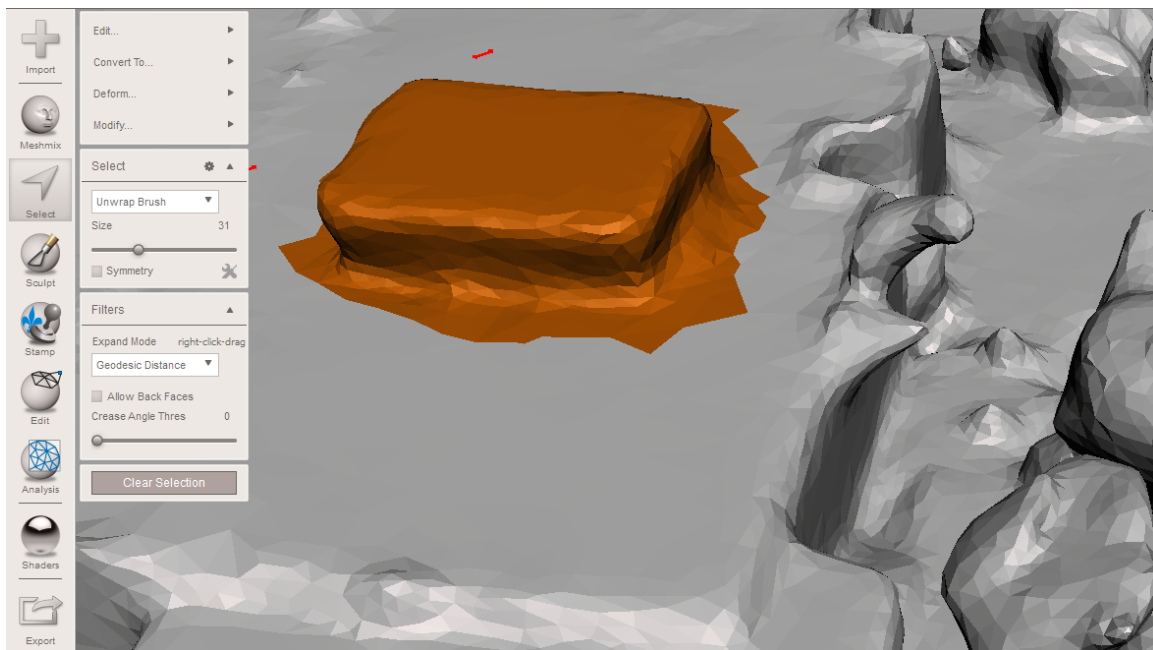
Auto Detection and Correction of Model Defects

1. From the **File** menu, click **Import**.
2. Browse to the required PhotoMesh model and click **Import**. The mesh model is loaded to the scene.
3. On the main toolbar, click **Analysis**, and then select the **Inspector** tool.
4. Left-click on a sphere to auto detect defects in the mesh. MeshMixer color codes areas with defects as follows:
 - Blue spheres – Holes
 - Red spheres – Non-manifold areas
 - Magenta spheres – Disconnected components

Discarding Specific Faces of the Model and Filling the Resulting Holes

If you want to discard specific faces of the model and fill the resulting holes:

1. On the main toolbar, click **Select** and then use the selection toolset to select the faces of the model that you want to discard.



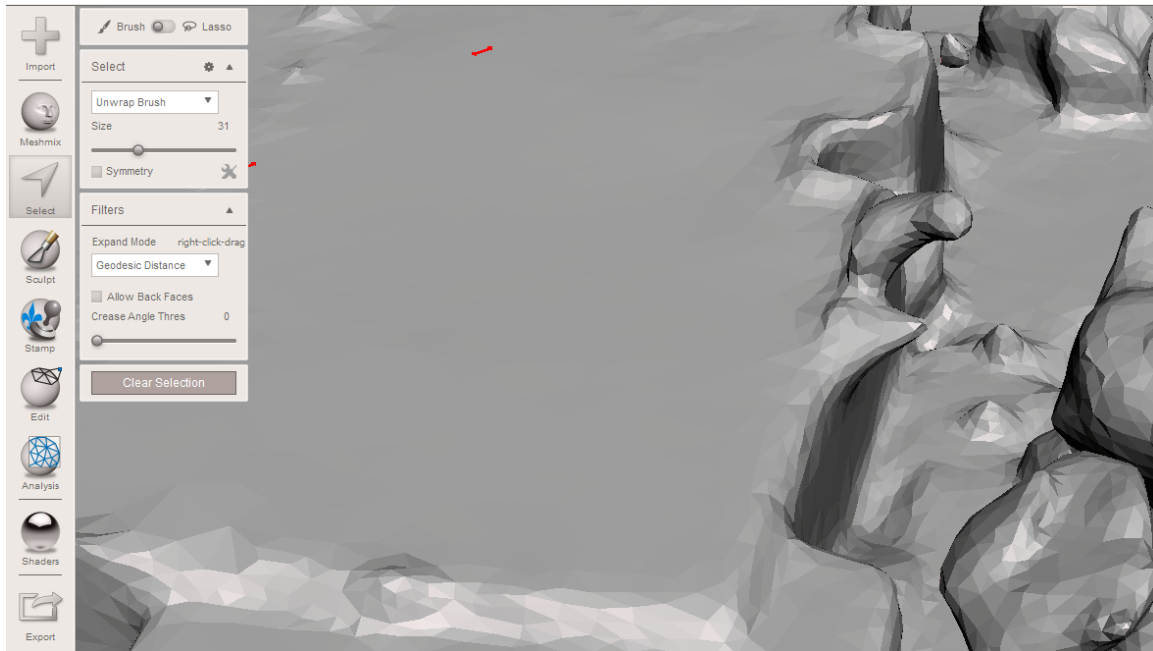
2. From the **Edit** menu (Select>Edit), select **Discard** (Hotkey: X).



3. Using the **Select** toolset again, double-click the edges of the created hole to select the hole.



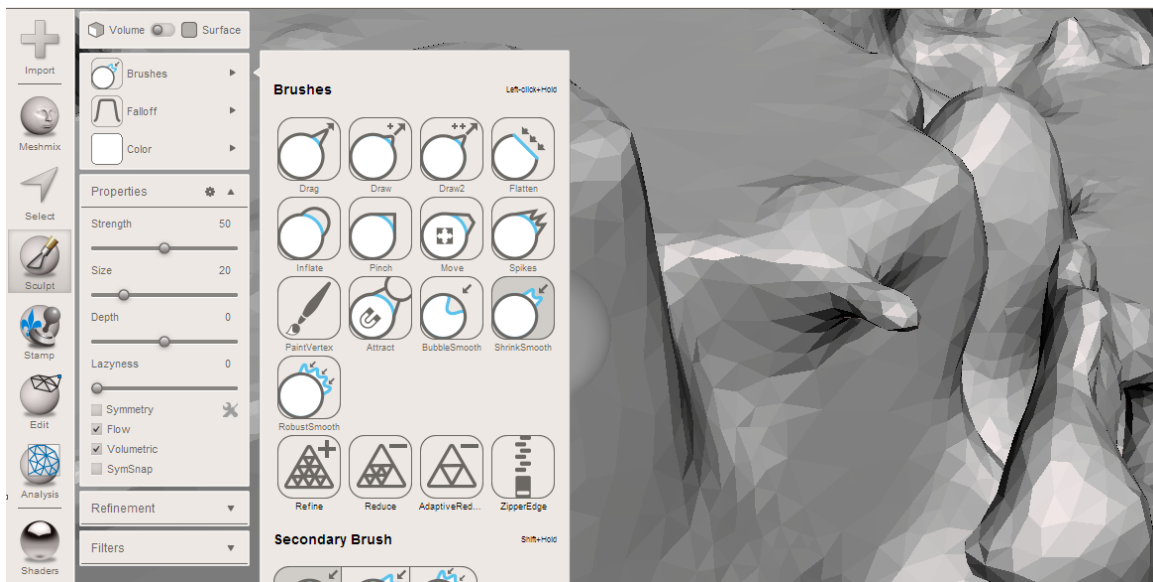
4. From the **Edit** menu, select **Erase & Fill** (Hotkey: F) to fill the hole.



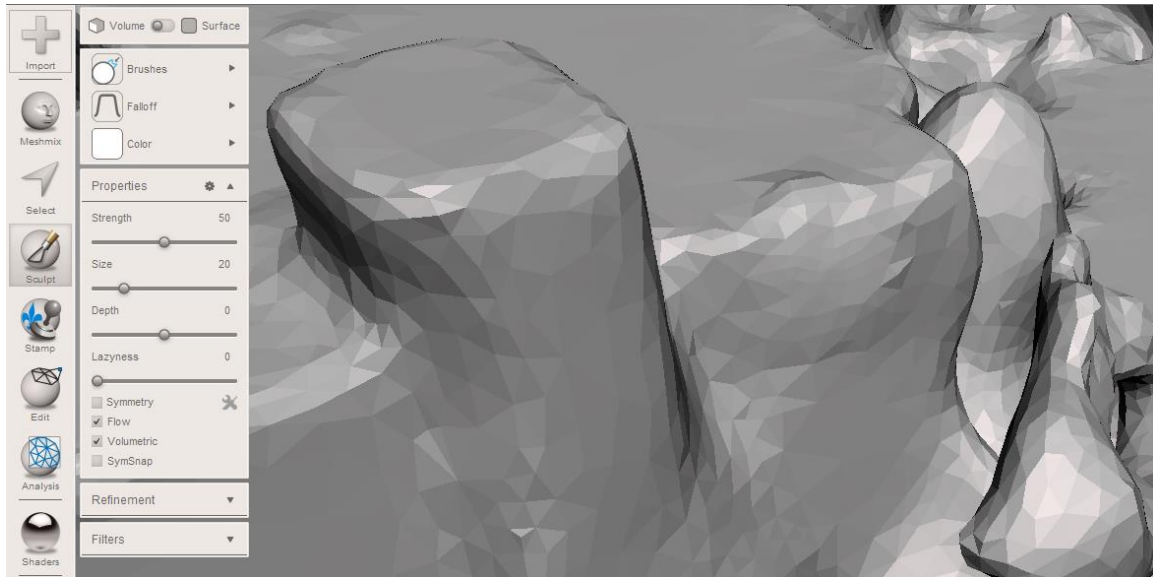
Smoothing Bumps or Bubbles in the Model

If you want to smooth bumps or bubbles in the model:

1. On the main toolbar, click **Sculpt**, and toggle on the **Volume** brushes.
2. From the **Brushes** menu, select the **ShrinkSmooth** brush.



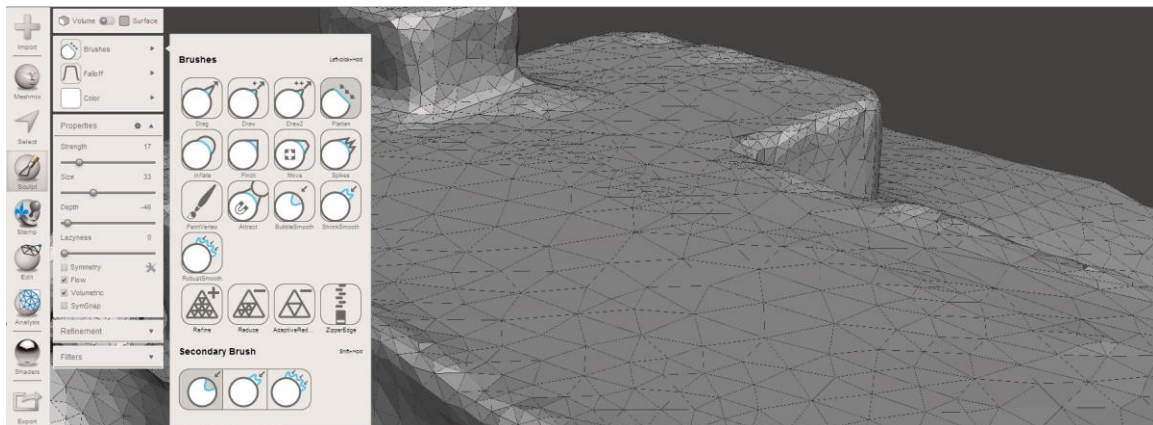
3. Click and hold down the left mouse button to shrink the bubble.



Flattening an Area

If you want to flatten an area:

1. On the main toolbar, click **Sculpt**, and toggle on the **Volume** brushes.
2. From the **Brushes** menu, select the **Flatten** brush.

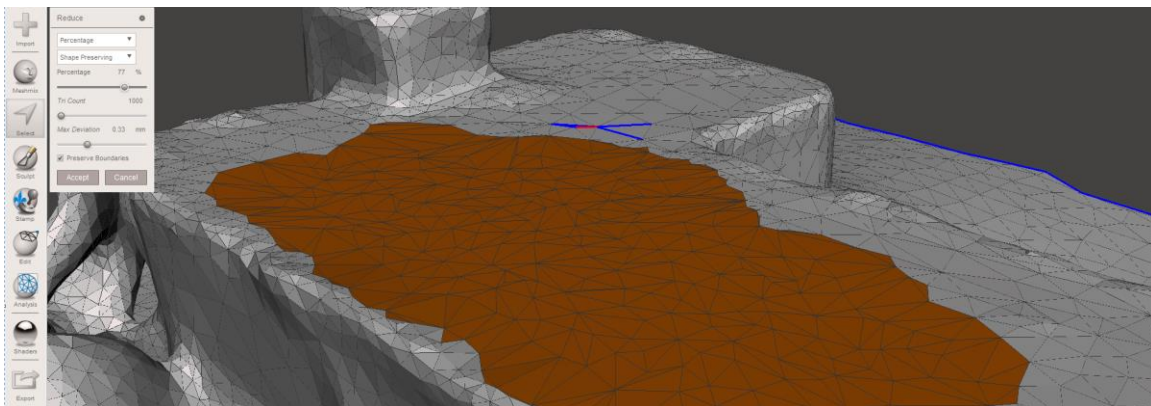
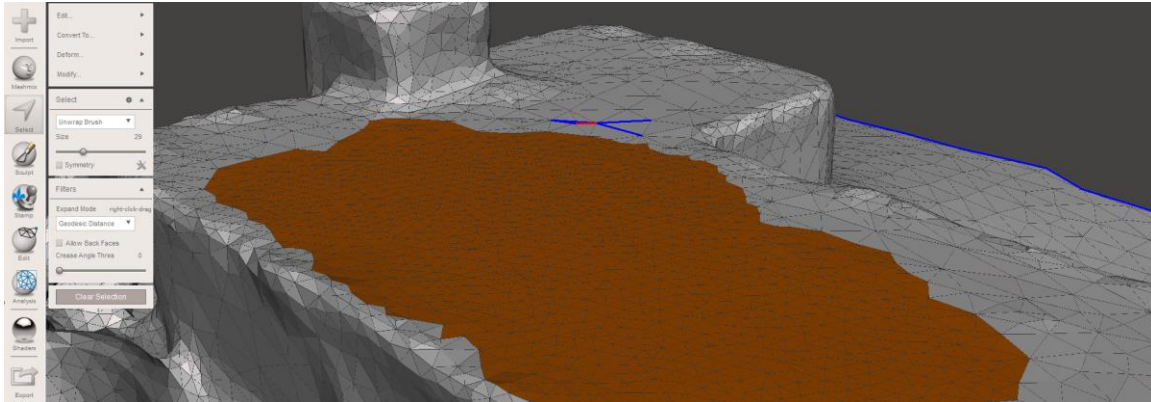


3. Click and hold down the left mouse button to flatten the area.

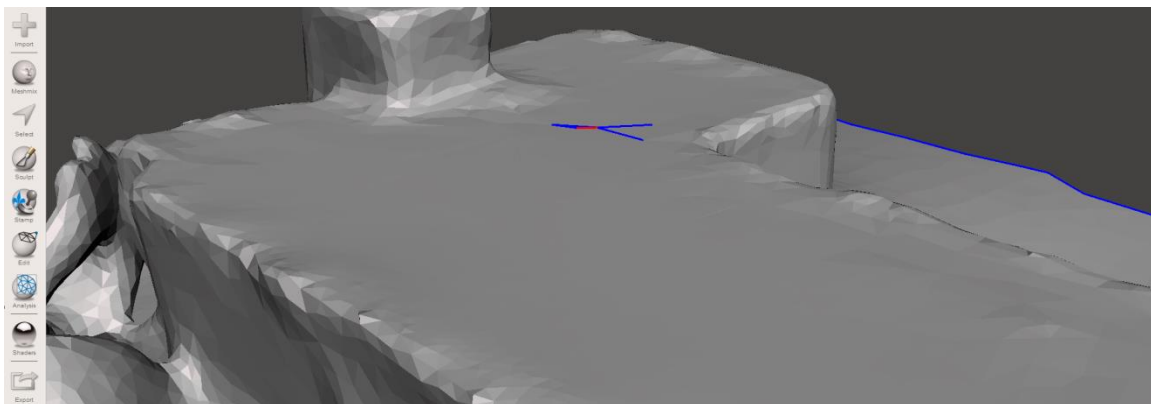
Reducing the Number of Triangles in an Area

If you want to reduce the number of triangles in an area:

1. On the main toolbar, click **Select**, and select the area.
2. From the **Edit** menu, select **Reduce**.



3. Click **Accept** to accept the changes.



Common Hotkeys

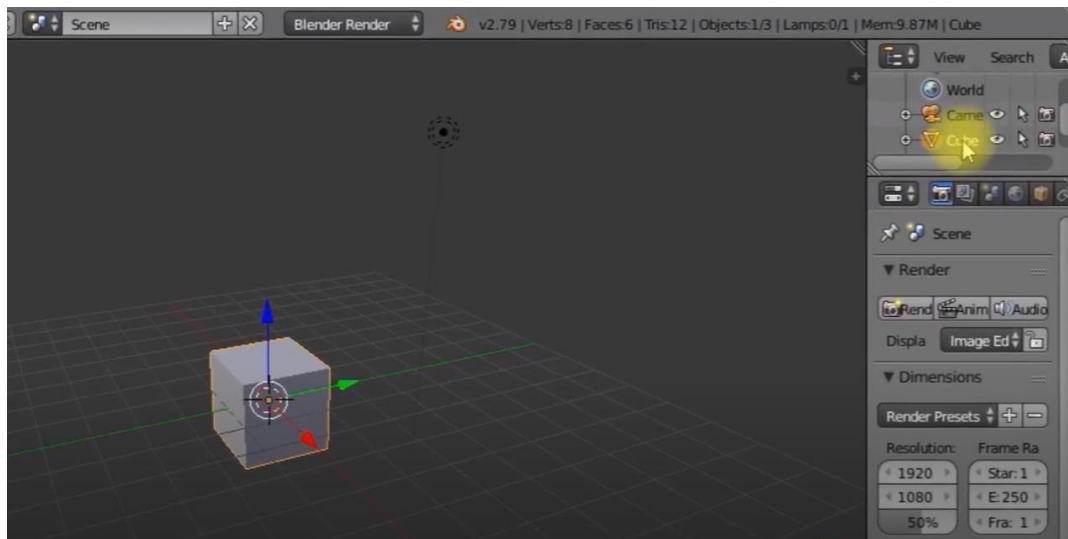
Command	Hotkey
Wireframe	W
Select Faces	S
Select Connected	E
Discard	X
Erase & Fill	F
Remesh	R
Surface brush	1
Smooth Brush	2
Volume Brush	3
Brush Size	[]
HotBox	Space

Editing Mesh Texture with Blender v2.79

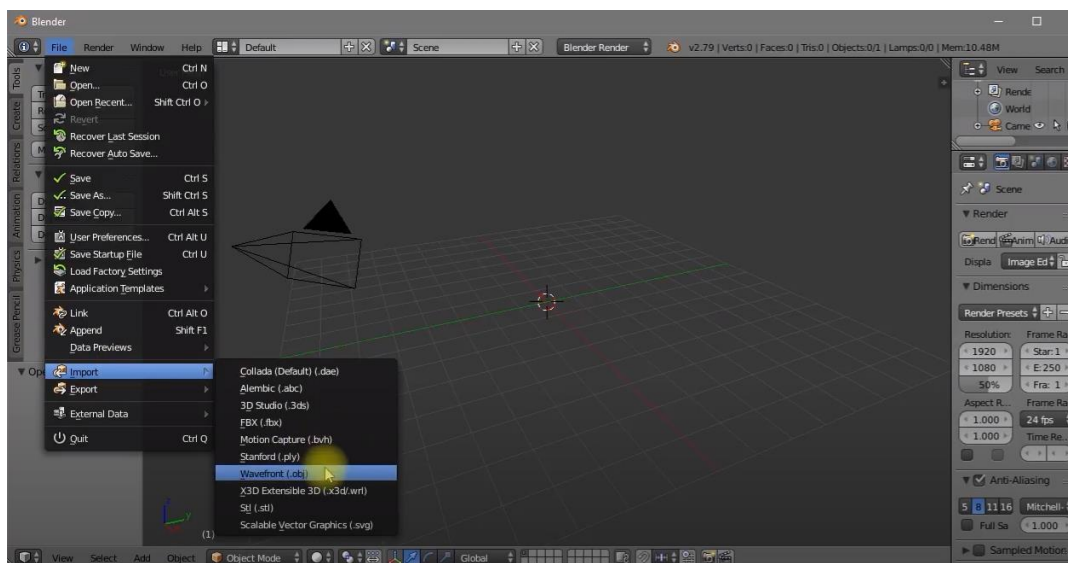
This section outlines the basic tools for editing mesh texture. For more advanced tools, see the Blender [user manual](#) and [online tutorials](#).

Loading the Model into Blender

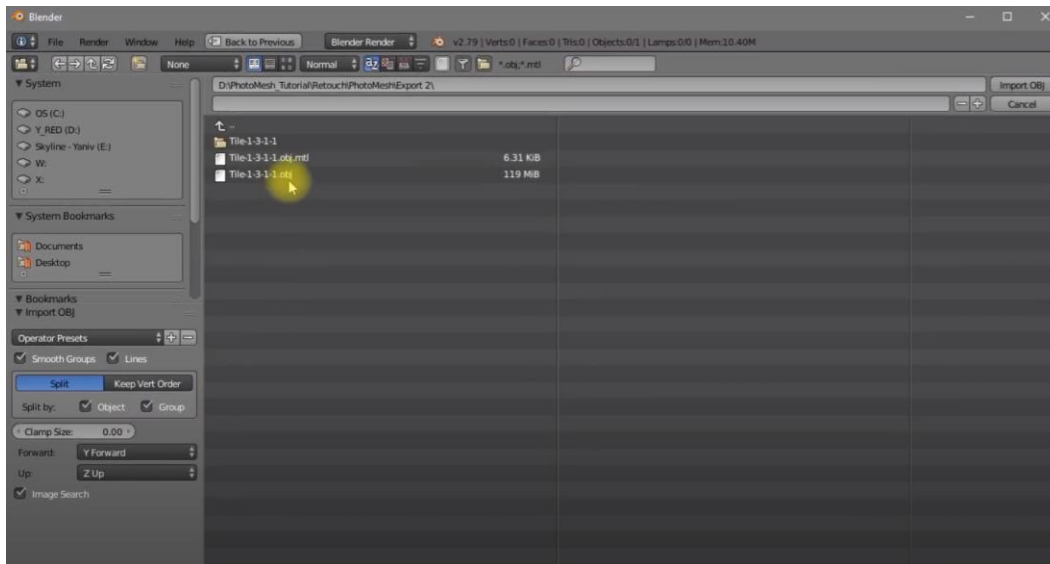
1. Open Blender and create a new project. By default, the project is loaded with a Cube model and a Lamp.



2. On the **Scene Collection** layout, right-click on the Cube and the Lamp objects, and select **Delete** to delete them.



- From the **File** menu, click **Import**, and select **Wavefront (*.obj)**.



- On the **Import OBJ** panel, set the following properties:

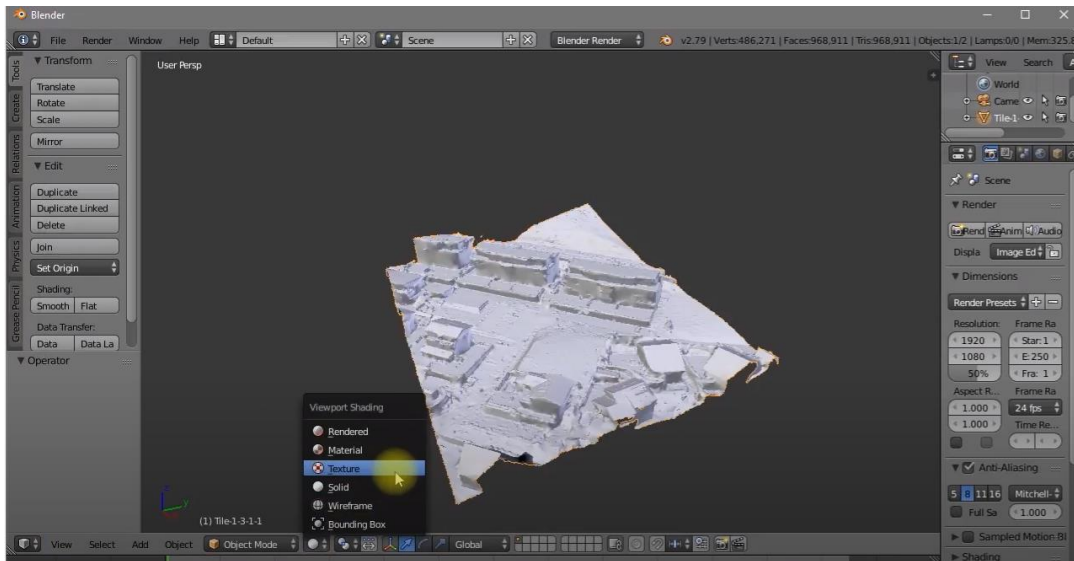
- **Forward:** Y Forward
- **Up:** Z Up



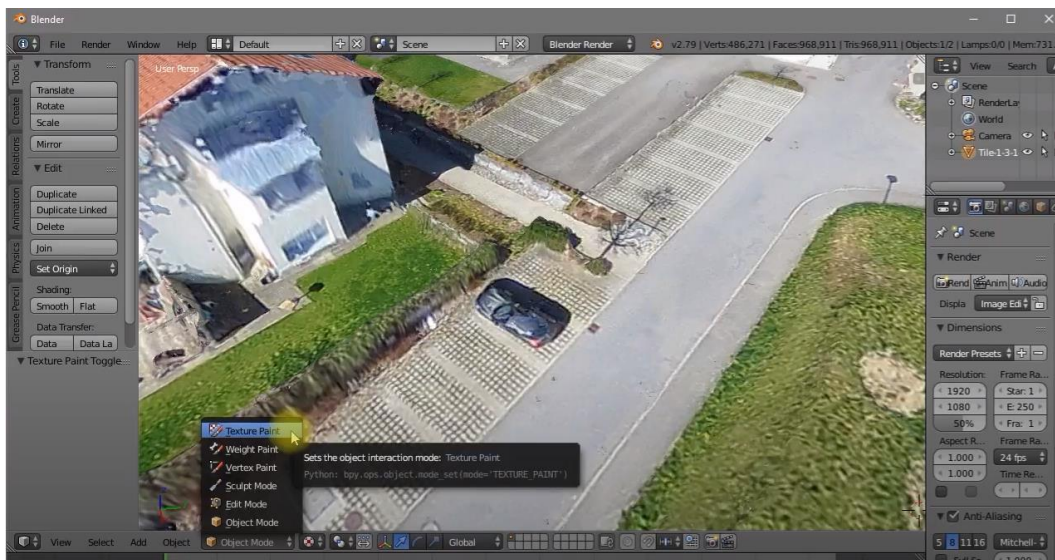
- Browse to the PhotoMesh exported OBJ folder, select the OBJ file and click **Import OBJ**.
- On the **Scene Collection** layout, select the object. Then from the **View** menu, select **View Selected** to center the view on the selected object.

Editing Mesh Texture

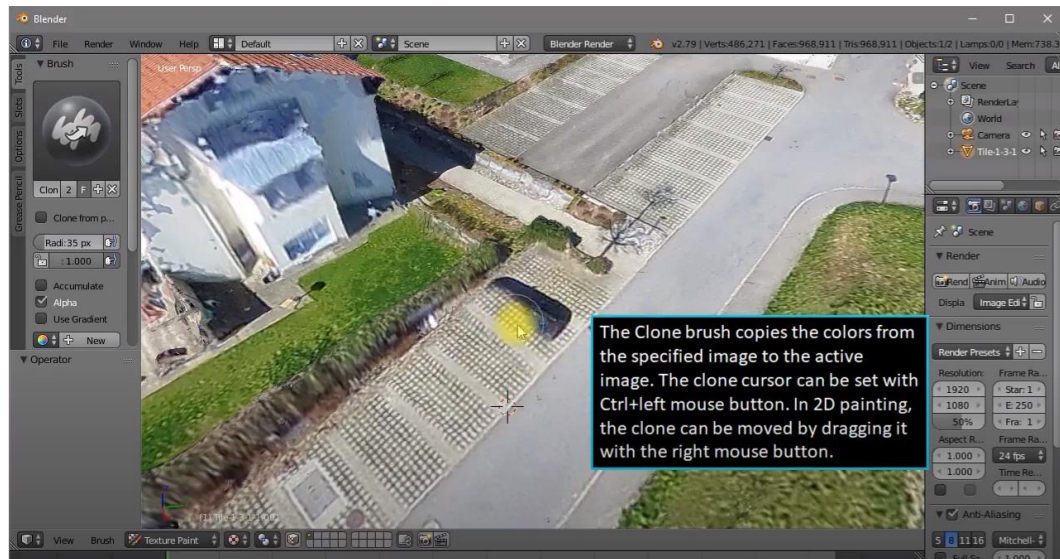
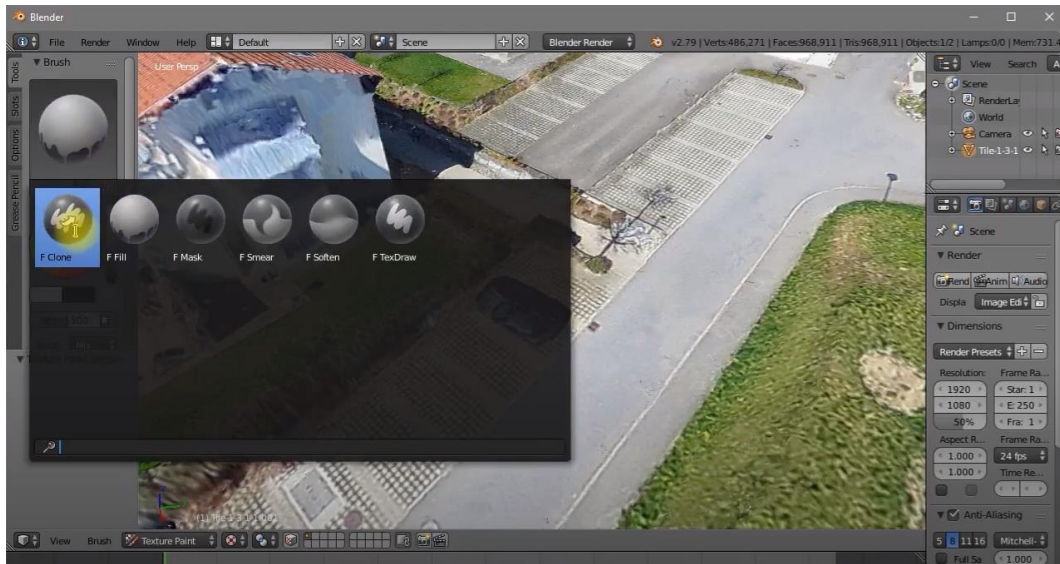
1. From the **Viewport Shading** menu, select **Texture**, to display the object as solid with texture.



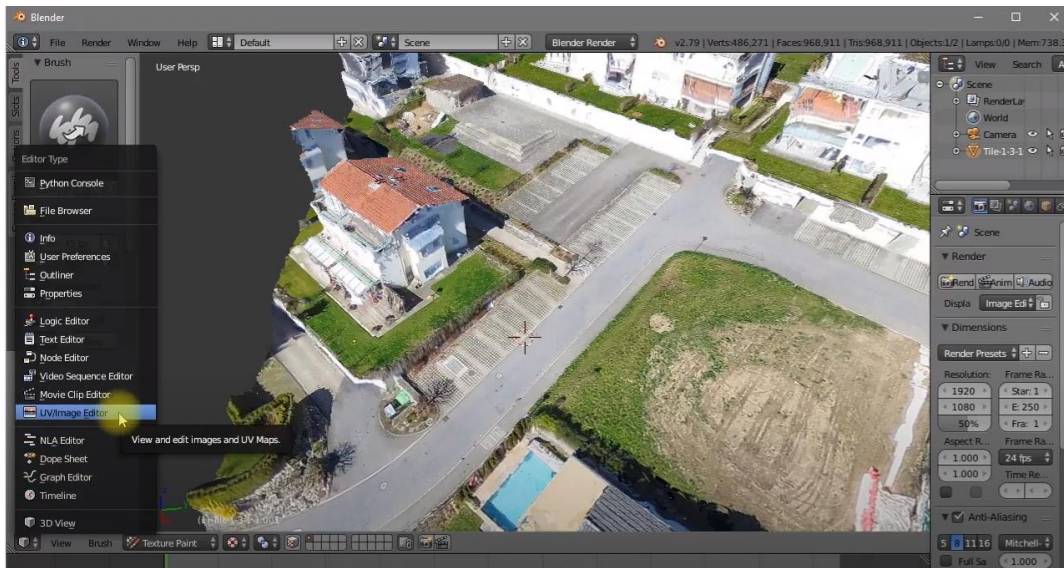
2. Navigate to the area with the texture that you want to fix.
3. From the **Object Mode** menu, select **Texture Paint**.



- Use the brushes to fix the texture. The Clone brush, for example, copies the colors from the specified image to the active image. The clone cursor can be set with CTRL + left mouse button. In 2D painting, the clone can be moved by dragging it with the right mouse button.

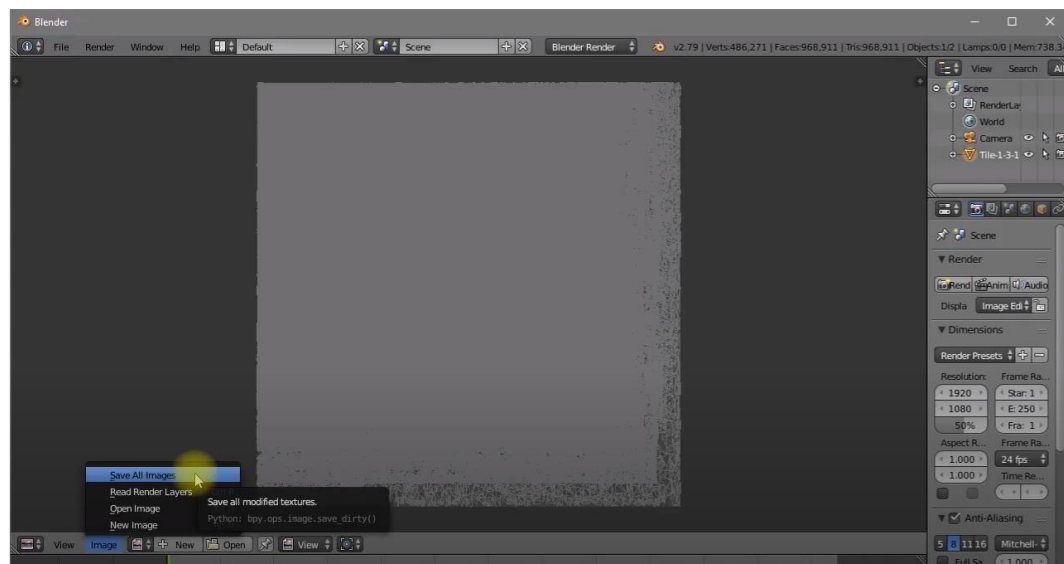


5. From the **View** menu, select **UV/Image Editor**.

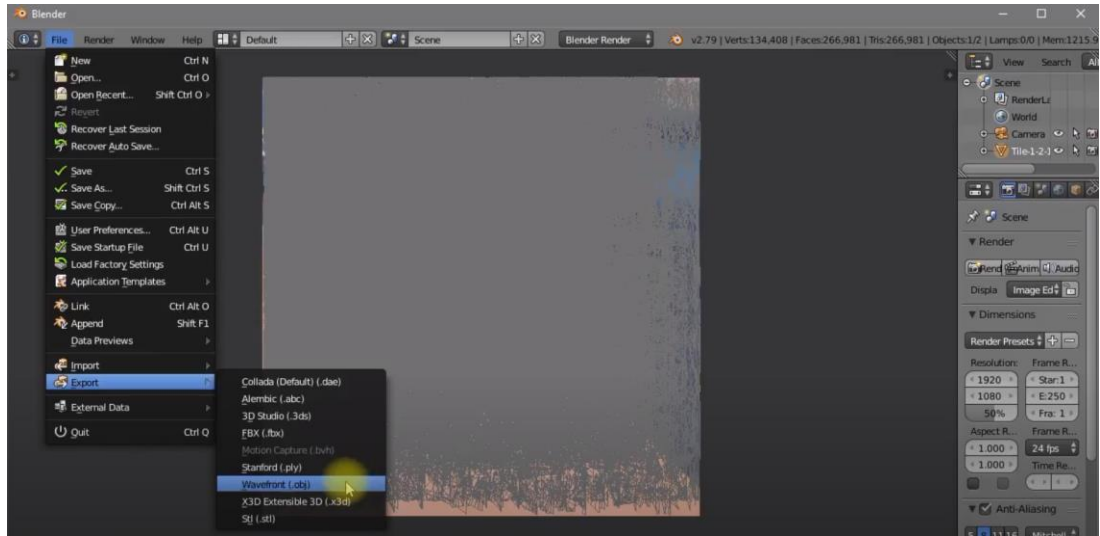


6. From the **Image** menu, select **Save All Images** to save the textures.

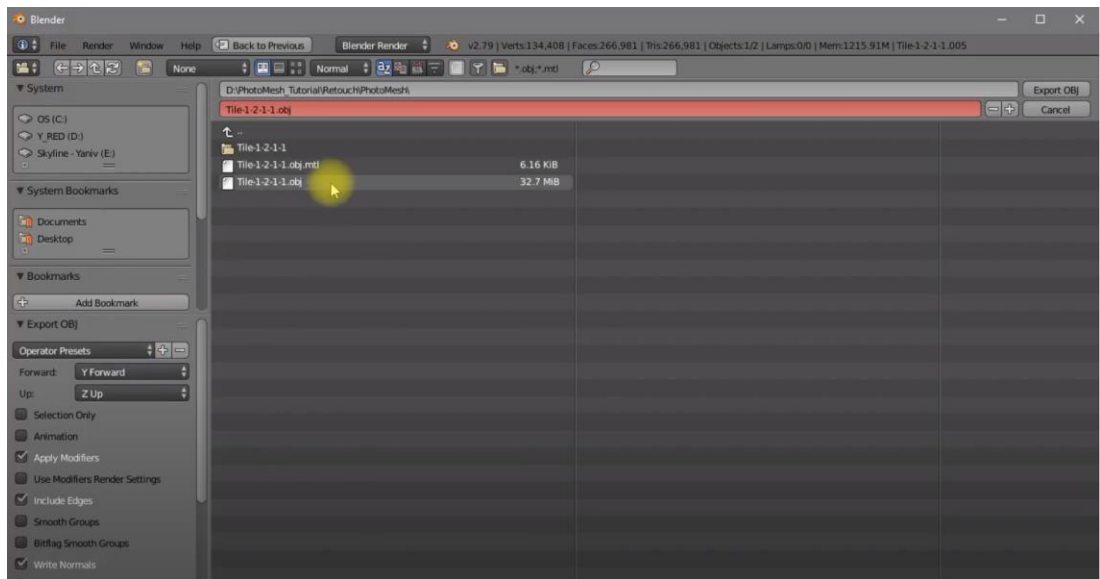
Note: When reimporing the edited textures into PhotoMesh, browse to the folder in which you saved these textures, and select the **Import only textures** option. See [Step 3: Import the edited models back to PhotoMesh](#) for more information.



7. If you edited both geometry and textures in Blender, do the following:
 - a. From the **File** menu, click **Export**, and select **Wavefront (*.obj)**.



- b. On the **Export OBJ** panel, set the following properties:
- **Forward:** Y Forward
 - **Up:** Z Up



- c. Select the OBJ and click **Export OBJ** to overwrite the model.
- Note:** When reimporting the model and textures into PhotoMesh, select the **Import model and textures** option. See [Step 3: Import the edited models back to PhotoMesh](#) for more information.