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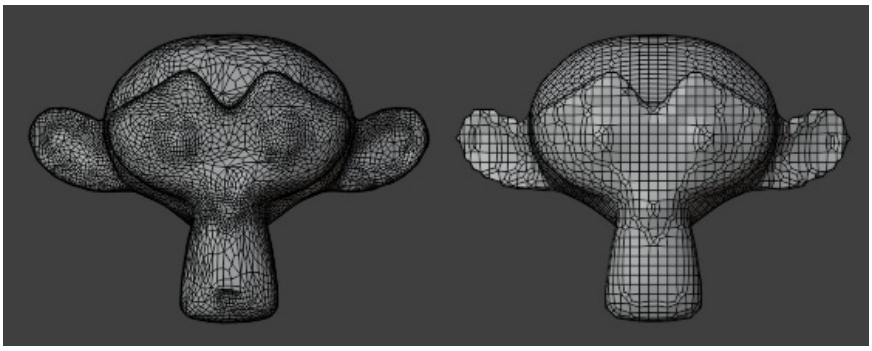
Remeshing

Blender offers several tools for regenerating a mesh so that it has (approximately) the same shape but fewer faces, more faces, or better topology.



Remeshing to clean up messy geometry.

Remeshing

Reference

Mode:
Object Mode, Sculpt Mode

Panel:
Properties ▸ Data ▸ Remesh

Remeshing automatically rebuilds the mesh with a uniform topology. You can run it with a high resolution to make a simple mesh denser, making it more suitable for sculpting. Alternatively, you can run it with a low resolution to simplify and clean up overly dense or messy geometry, such as from a sculpt o 3D scan.

Note

- Remeshing only works on the original mesh data – it ignores modifiers, shape keys and so on.
- Remeshing is not possible on objects with a Multiresolution Modifier.

The *Remesh* panel lets you choose between two different modes:

Voxel

The Voxel remesher works by placing the mesh in a virtual 3D grid, seeing which points of the grid are closest to the mesh's outer surface, and generatin a new mesh with vertices at those points. This means the resulting mesh has uniform topology and has no inner (self-intersecting) geometry.

It's useful for the following cases:

- Changing the resolution of, or generally cleaning up, a mesh that you want to sculpt. Notably, by setting up the resolution before sculpting, you can lea Dyntopo disabled and avoid its performance impact.
- Cleaning up a mesh for 3D printing.
- Generating a simplified standin mesh for use with physics simulation.

However, because the topology is just a simple grid, the Voxel remesher should *not* be used for the following:

- Creating topology for a mesh that will be deformed (e.g. a character that will be animated). Such topology has to follow the flow of the geometry, and no perfect automatic tools exist for this right now; it has to be done manually. See Retopology.
- Generating a mesh for applying the Subdivision Surface Modifier or the Multiresolution Modifier. It's better to use the Quad mode for this.
- Reducing the face count of a mesh that otherwise has no problems with its geometry. It's better to use Decimate Geometry for this.

Voxel remesh has the following settings:

Voxel Size

The size of each voxel (3D grid cell). Use a low value to get a detailed but dense mesh, or a high value for a light but coarse one.

Adaptivity

Reduces the final face count by simplifying geometry where detail is not needed. A value greater than zero disables *Fix Poles* and can introduce triangulation.

Fix Poles

Tries to reduce the number of Poles at the cost of some performance, to produce a better topological flow.

Preserve

Volume

Try to preserve the original volume of the mesh. Enabling this could make the operator slower depending on the complexity of the mesh.

Attributes

Transfer attributes to the new mesh: the paint mask, any face sets, color attributes, and so on.

See also

The Remesh Modifier can perform this operation non-destructively and offers more remeshing methods.

Quad

The Quad remesher uses the Quadriflow algorithm, which can produce better results but is also slower. It's not a replacement for the Voxel remesher, however, because it doesn't clean up intersecting geometry.

It's useful for the following cases:

- Generating a mesh for applying the Subdivision Surface Modifier or the Multiresolution Modifier.

However, it's not recommended for the following:

- Cleaning up a mesh for sculpting or 3D printing. The Voxel remesher is more suited for this.
- Creating final topology for a mesh that will be deformed (e.g. a character that will be animated). Such topology has to follow the flow of the geometry and no perfect automatic tools exist for this right now; it has to be done manually. See Retopology.
- Reducing the face count of a mesh that otherwise has no problems with its geometry. It's better to use Decimate Geometry for this.

Quadriflow Remesh

Opens a pop-up to set parameters for the remesh operation.

Use Mesh Symmetry

Generates a symmetrical mesh using the Mesh Symmetry options.

Preserve Sharp

Try to preserve sharp features of the mesh. Enabling this could make the operator slower depending on the complexity of the mesh.

Preserve Mesh Boundary

Try to preserve the original volume of the mesh. Enabling this could make the operator slower depending on the complexity of the mesh.

Preserve Attributes

Transfer attributes to the new mesh: the paint mask, any face sets, color attributes, and so on.

Smooth Normals

Apply Shade Smooth to the new mesh.

Mode

How to specify the amount of detail for the new mesh.

Ratio:

Specify target number of faces relative to the current mesh.

Edge Length:

Specify target edge length in the new mesh.

Faces:

Specify target number of faces in the new mesh.

Seed

Random Seed to use with the solver; different seeds will cause the remesher to generate different quad layouts on the mesh.

Retopology

The automatic remesh tools generally don't result in topology that lends itself to deformation. Therefore, if you have sculpted a character and want to simplify it for animation, you'll typically have to do this manually in a process known as retopologizing.

To do this, you typically create a new mesh that overlaps the original one, then adjust it until it fully covers the original mesh and matches its shape.

- The Retopology overlay of the 3D Viewport is useful here, as it lets you see the original mesh through the retopologized one and vice versa – without getting distracted by geometry on the other side as would be the case with X-Ray.
- You can use the Poly Build tool to quickly add, change, and remove faces.
- Use Snapping to align new vertices to the original mesh.