
Conform Object

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Fig. 1: Conform Object at work

WHAT IS CONFORM OBJECT?

is a Blender add-on for any 3D modeler that needs to project objects onto another object's surface in one action. The add-on handles the complexity of doing this for you in a non-destructive way.

FEATURES:

- Simple right-click menu option performs the *operation in one go*.
- *Graduate the effect* from the bottom to the top of the object.
- Choose from *Grid Mode* or *Shrinkwrap Mode*.
- Transfer surface normals to *blend object shading*.
- Underlying mesh is not affected.
- Undo and apply options handle the underlying complexity of adding and removing modifiers.
- *Conform multiple objects at once*.
- *Display Vertex Weights in Object Mode* to help with the *Gradient Effect*.
- Presets system to save your preferred settings.

2.1 Installation

1. Go to *Edit -> Preferences*.
2. Select the *Add-ons* tab on the left if it is not already.
3. Select the *Install...* button along the top.
4. This will open a file dialog where you should navigate to where you have downloaded the **conform_object.zip** file. This file should not be unzipped.
5. Then, click the *Install add-on from file* button.
6. Search for the add-on by typing *Conform Object* in the search box if it does not already appear.
7. Make sure the checkbox next to the add-on (*Mesh: Conform Object*) is ticked:

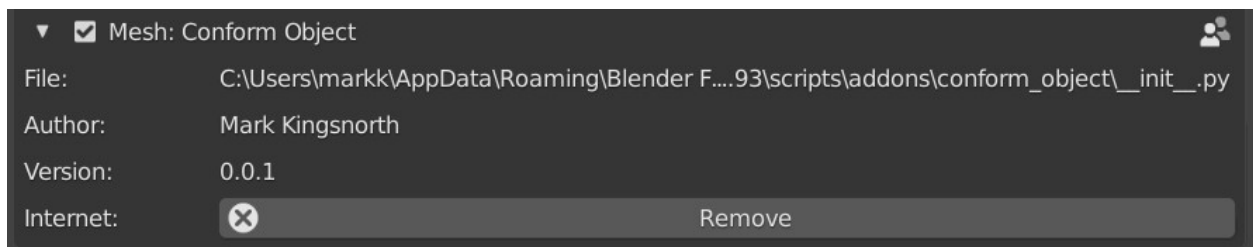


Fig. 1: Conform Object Installed

If you have any issues do not hesitate to get in touch via info@configure.net.

2.2 How To Use

Fig. 2: Select the **Source Object**, then the **Target Object**. Right-click and select “Conform Object” from the menu. Disable the *Gradient Effect* from the *Options* panel if needed. Further step by step guide below.

2.2.1 Step by Step

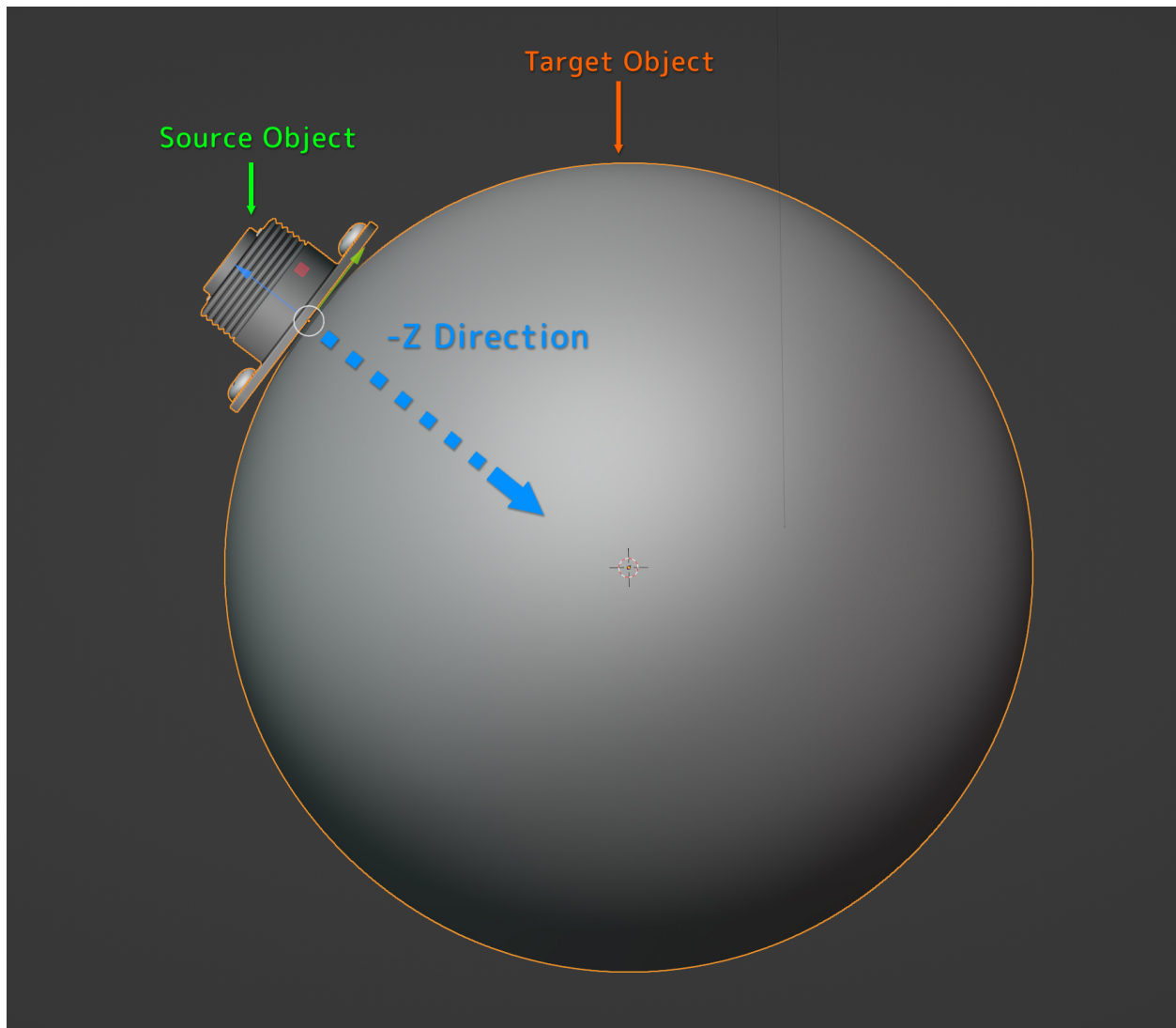


Fig. 3: The Source Object is ideally rotated on its local axis so that its base is pointing towards the Target Object.

To conform a **Source Object** to a **Target Object**:

1. Move and rotate the **Source Object** near, or on top of, the surface of the **Target Object** you wish to project it onto:

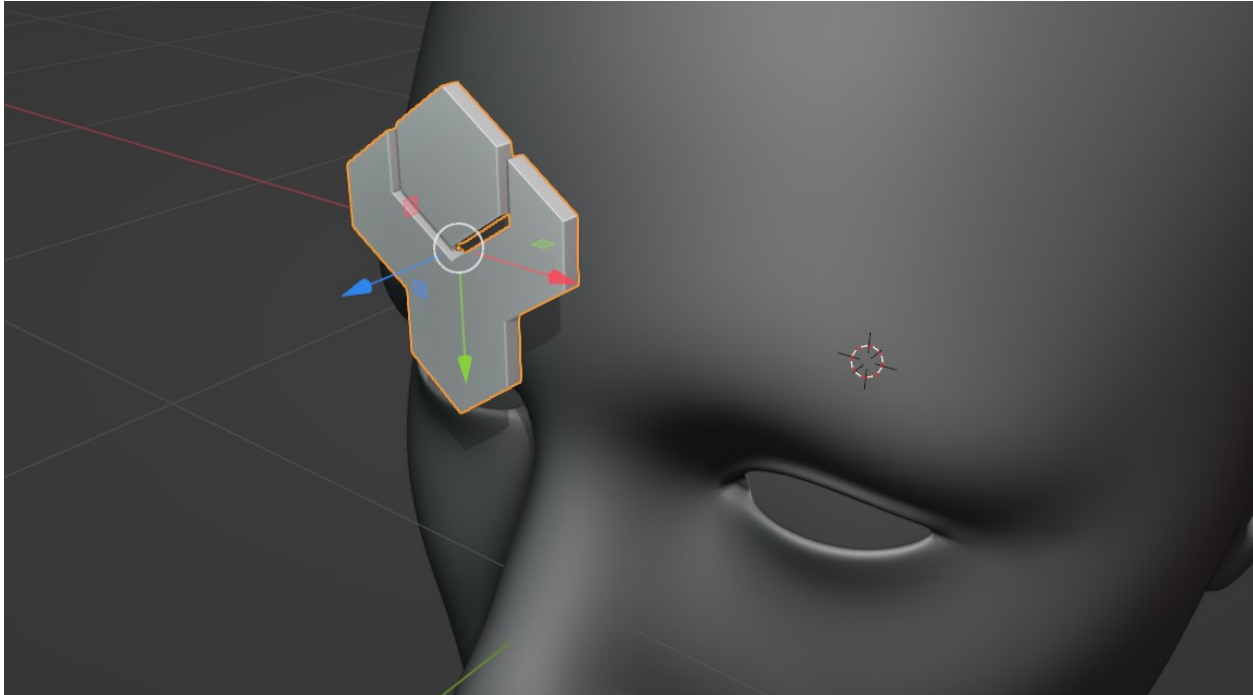


Fig. 4: Here, the **Source Object** has been rotated 90 degrees and is pointing towards the **Target Object**'s forehead.

Warning: Ideally, **Source Objects** should:

- Be rotated so that their local -Z axis is aimed towards the **Target Object** surface. Use the *Toggle Surface Snapping* feature to align your **Source Object** like this.
- Have a good level of topology so that they can be deformed (good number of vertices and quad faces).
- Not have modifiers such as booleans which are dependent on other objects.
- Not have parents/children.

Tip: You can automatically rotate the **Source Object** so that is pointing towards the **Target Object**'s surface using the *Toggle Surface Snapping* option.

2. Select both the **Source Object** and then the **Target Object**:

To do this:

1. First, click the **Source Object** to select it if it isn't already.
2. Then, hold the *Shift* key, and then click the **Target Object** to select it **last**. This will make the **Target Object** the active object.

Both objects need to be selected this way for Conform Object to work.

3. Right-click in the viewport, and select the **Conform Object** menu. Select **Conform Object**:

Tip: You can quickly access this option by clicking the *Conform Object* icon at the top of the viewport menu:

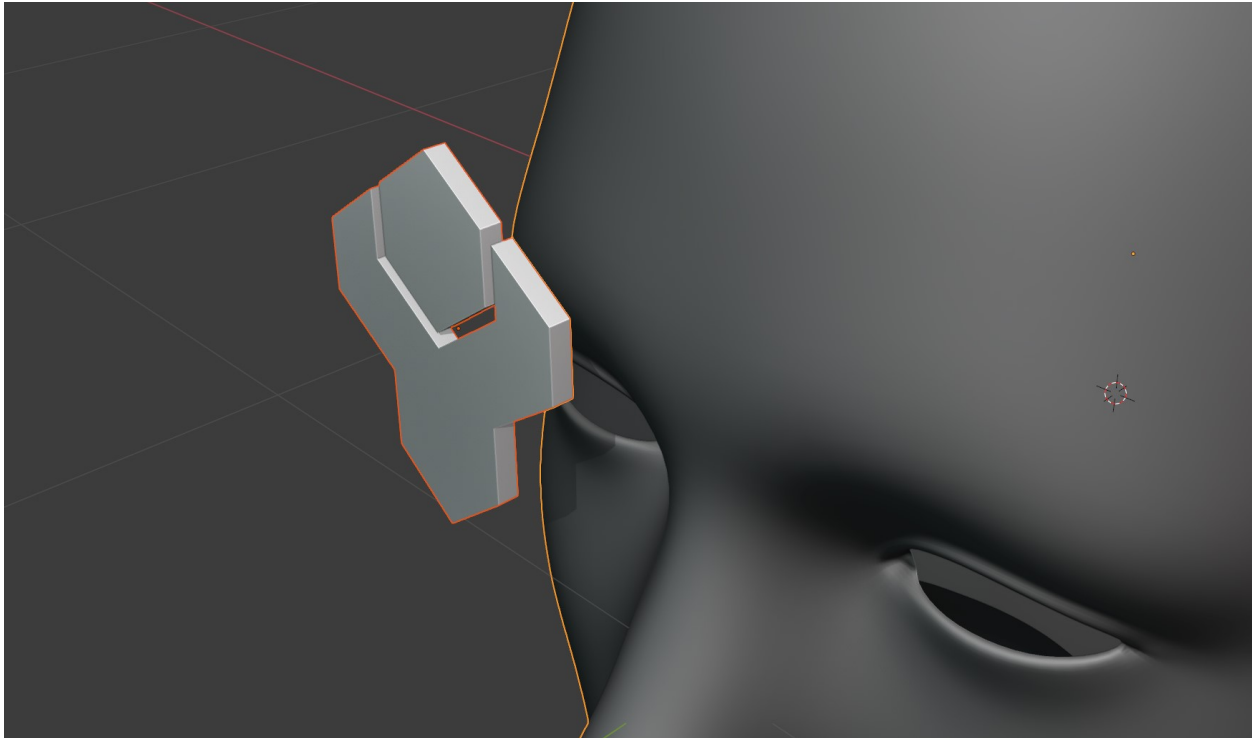
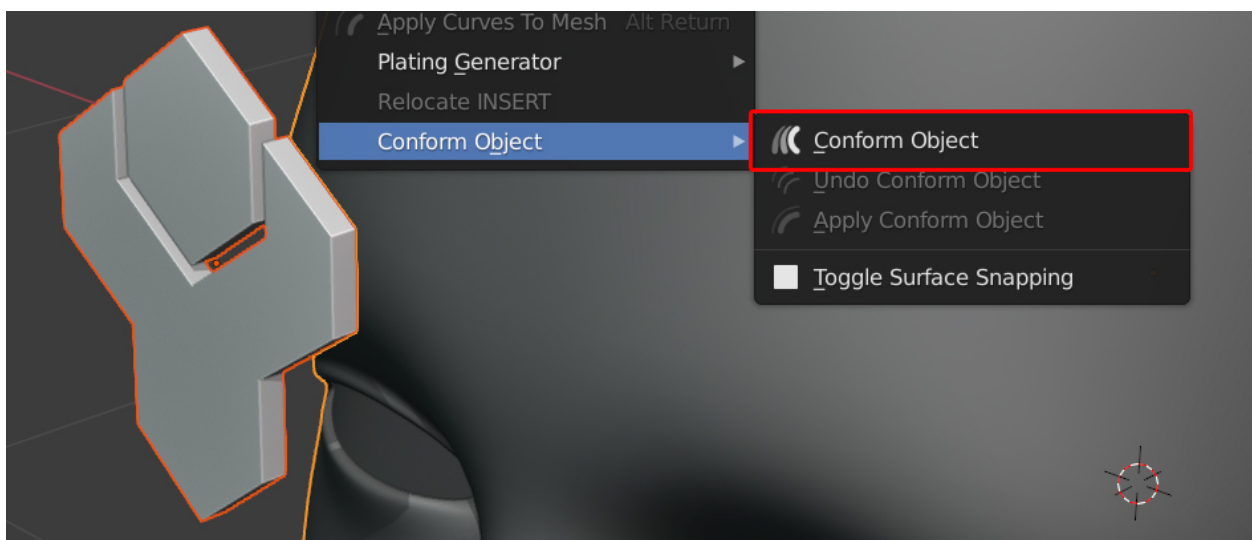
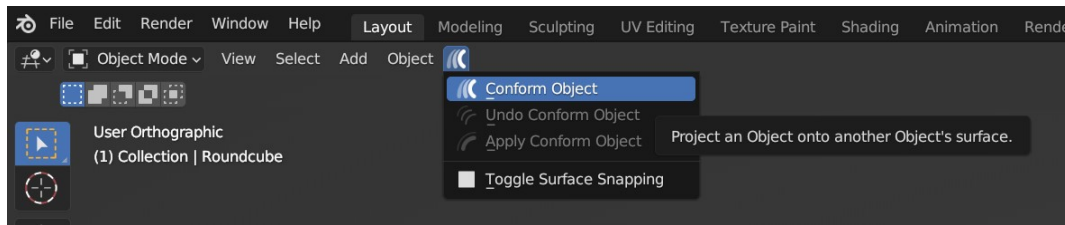


Fig. 5: Both objects selected, with the Target Object being the active object (the last object selected)





4. The **Source Object** will then conform to the **Target Object**. If the *Gradient Effect* is turned on, you may wish to untick it in the *Options* menu that appears in the bottom left of the viewport:

Fig. 6: Toggling on and off the *Gradient Effect*

5. Adjust the rotation of the object if needed by expanding the *Object Transform* section and adjusting the rotation:
6. The object should now be conformed to the Target Object. Expand the *Options* panel to adjust more parameters:

Fig. 7: The object, conformed with the *Options* panel.

2.2.2 Multiple Objects

It is also possible to conform multiple objects at once using the same operation:

1. Shift-click select the objects you want to conform, and then select the Target Object last (making it the active object).
2. Right-click and select the **Conform Object** sub menu.
3. Select the **Conform Object** option as usual.

You can then edit the *Options* of all the objects at the same time.

2.3 Options

2.3.1 Operator Presets

You can add or remove preset configurations from the tool here by pressing the + or - keys, or reset the tool to its default parameters.

Fig. 8: Conforming multiple objects at once.

Fig. 9: Options Panel in the bottom left of the viewport

2.3.2 Projection

The following controls the parameters of how the source object is projected onto the Target Object:

Direction

The different *Direction* modes control how the direction line is chosen when projecting the **Source Object**. You may wish to enable Grid visibility to see the different modes working:

- **Auto:** This mode will first try to project the Source Object onto the Target Object using the *negative Z* direction as usual, and if that fails, it will instead project onto the closest point on the Target Object.
- **Axis Line:** This will project a line from the middle of the **Source Object** in the X, Y or Z direction with the object's rotation taken into account. By default, the projection is in the local -Z direction. If the line misses, a warning message will be displayed.
- **Nearest:** This will project a line from the middle of the **Source Object** to the *closest point* on the Target Object. You may need to use the Transform Orientation section to adjust the position of the object whilst it is being projected.
- **Custom:** Specify a X/Y/Z rotation for the projection line.

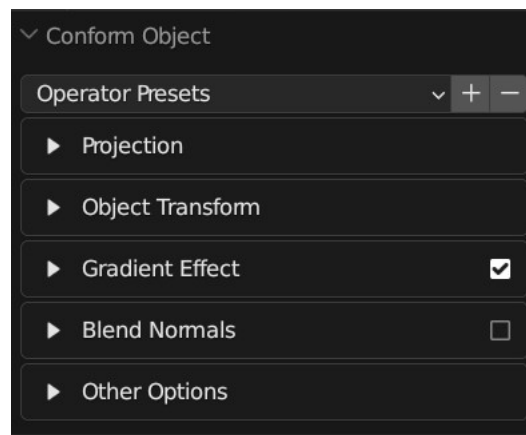


Fig. 10: The options panel with each section collapsed.

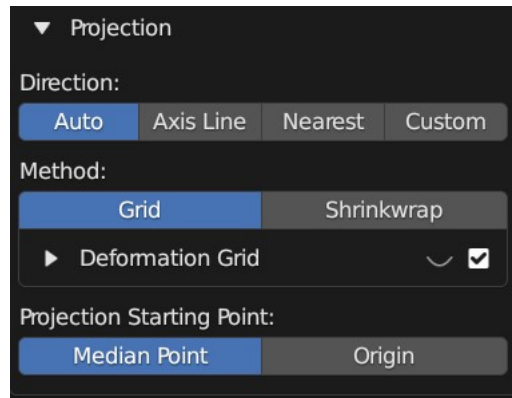


Fig. 11: The expanded Projection Panel

Fig. 12: A source object having its projection direction changed by *custom* mode (Grid mode visibility is turned on). When the direction line hits the Target Object, the Source Object begins to conform.

Method

This is the method used to deform the **Source Object**. Choose between *Grid Mode* or *Shrinkwrap Mode*:

- **Grid Mode:** This mode is [described here](#), and creates a projection grid object which is attached to the source object to create the deformation. The grid object is a regular blender object, parented to the source object.
 - **Visibility:** The grid object is hidden by default, but can be revealed by clicking the eye icon next to the *Deformation Grid* section:

Fig. 13: Switching on and off Grid visibility.

Tip: If you wish to hide the Grid again after the Conform Object operation is performed and the panel is gone, expand the Source Object in the Outline View to find the grid object:

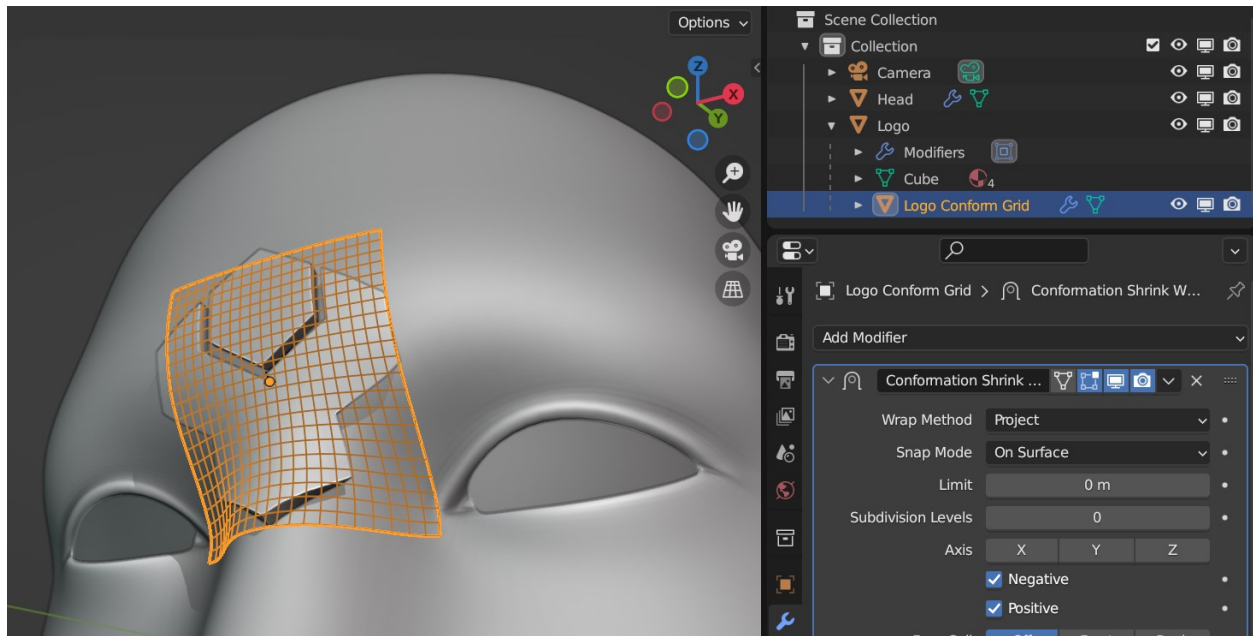


Fig. 14: Selecting the Grid on the Outline View.

Then make sure you have the *Disable In Viewports* flag ticked in the filters section of the Outline view:

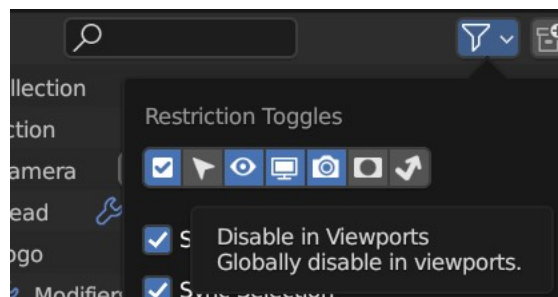


Fig. 15: Selecting the *Disable in Viewports* flag.

You can then hide the grid object completely again by clicking this flag next to the object in the Outliner view:

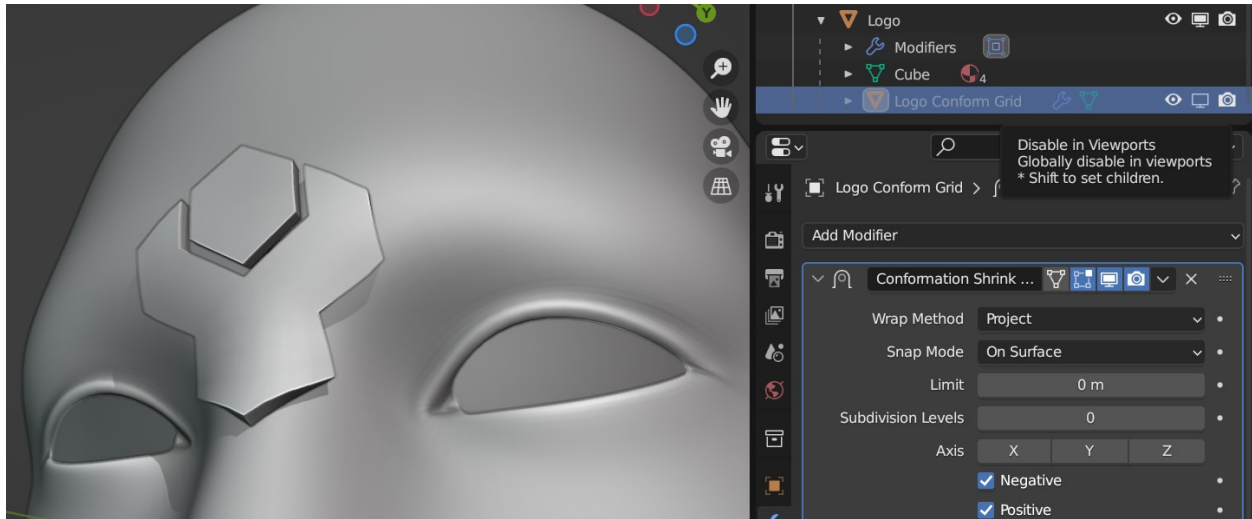


Fig. 16: The grid is hidden again.

- **Grid options:** By expanding the *Deformation Grid* section, you can change the default parameters of the grid:

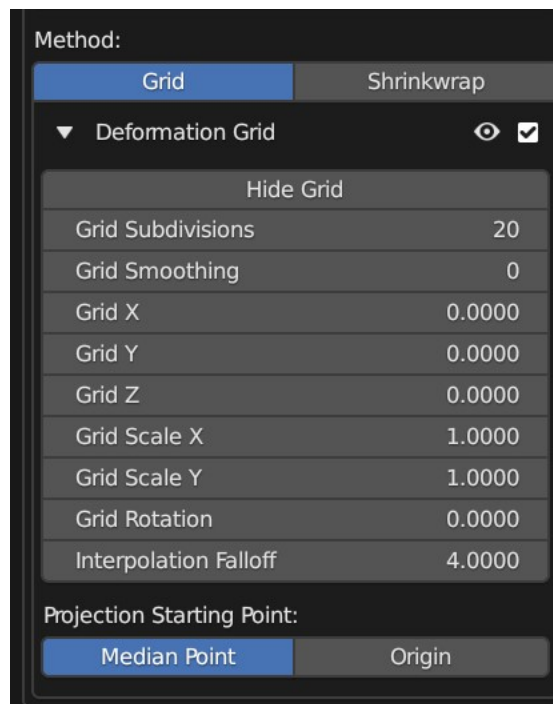


Fig. 17: Expanded Grid Options section.

- * **Show/Hide Grid:** By default, the deformation grid is hidden but it can be displayed if you wish to configure it. This is the same setting as the Eye icon in the *Deformation Grid* section header.

- * **Grid Smoothing**

Fig. 18: The deformation grid is revealed!

Fig. 19: Applying a Subdivision Surface modifier to the grid for smoothing: Levels 0, 1 and 2 are applied here.

This adds a *Subdivision Surface* modifier to the grid. This helps smooth the deformation grid over jagged surfaces.

* **Grid Subdivisions**

Fig. 20: Subdividing the grid increases the resolution of the deformation.

Not to be confused with grid smoothing, this is the number of vertices in the grid. If you are deforming over particularly smoothed or high resolution meshes, increasing this number can be useful.

* **Grid X/Y**

Move the grid's X/Y position.

* **Grid Scale X/Y**

Scale the grid in the X/Y direction.

· **Grid Rotation**

Rotate the grid over the surface.

- **Interpolation Falloff:** Used on the for the grid. From the Blender : *“How much a vertex bound to one face of the target will be affected by the surrounding faces (this setting is unavailable after binding).”*

Projection Starting Point

This parameter controls where the beginning of the projection line from the Source Object to the Target Object should be:

- **Median Point:** By default, the start of the projection line will be from the middle point of the Source Object's geometry.
- **Origin:** Alternatively, you can make the projection line start from the Source Object's origin point in the 3D scene.

2.3.3 Object Transform

These parameters control how the **Source Object** is positioned onto the **Target Object** during the *Conform Object* operation.

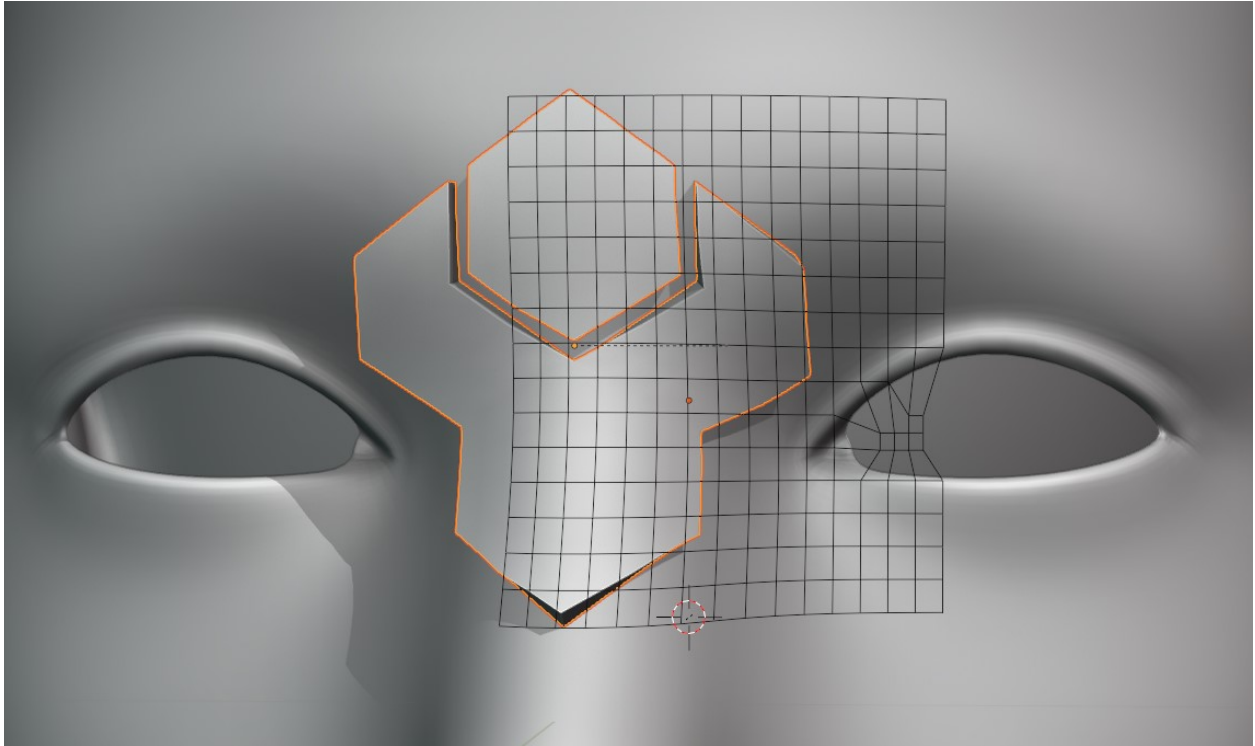


Fig. 21: Grid moved in X direction.

Fig. 22: Scale the influence of the grid.

Fig. 23: Grid rotated on surface.

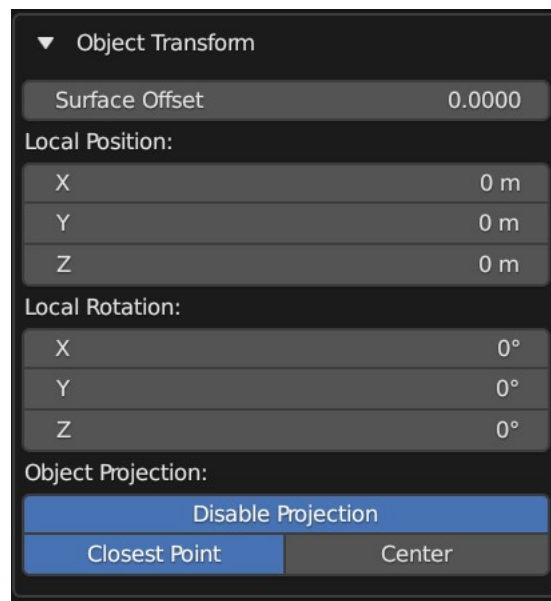


Fig. 24: The expanded Object Transform Panel

Surface Offset

This parameter controls how far away the **Source Object** is offset from the **Target Object**'s surface.

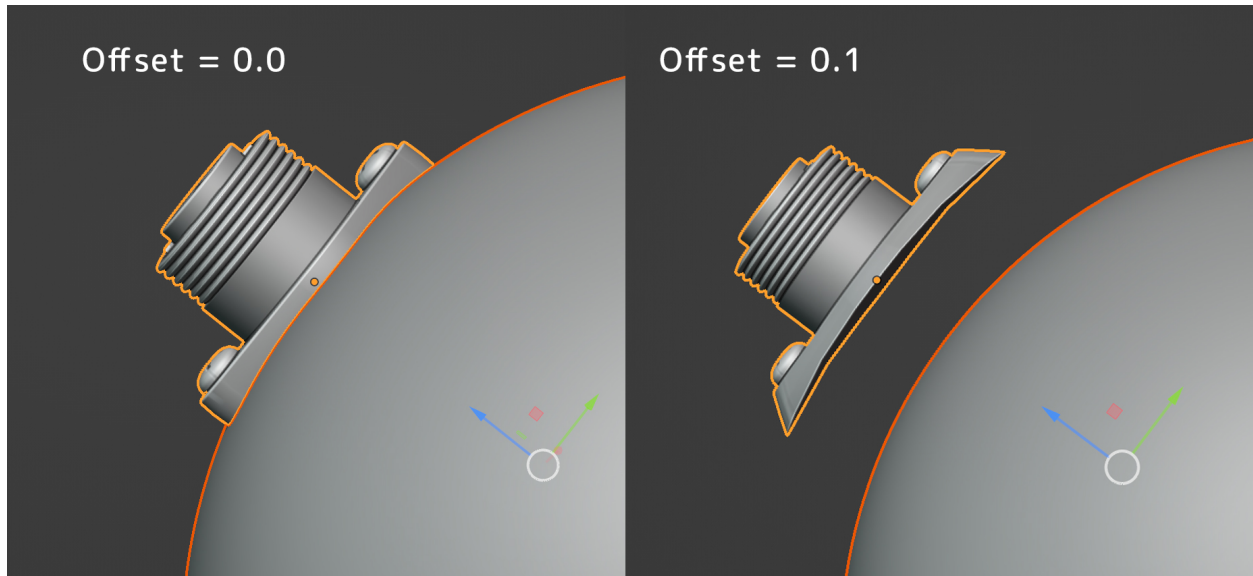


Fig. 25: Source Object being offset.

Local Position

Once the **Source Object** has been projected, this controls the relative position of the **Source Object**.

Fig. 26: Source Object being repositioned.

Local Rotation

This controls the rotation of the **Source Object** once it has been projected. This is useful for adjusting the orientation of the object after the initial projection.

Fig. 27: Source Object being rotated on the surface.

Object Projection

Here you can choose which point on the **Source Object** is used to position it on top of the **Target Object**'s surface.

- **Disable Projection:** Disable projection entirely. This will stop the Source Object from being moved, which can be useful when trying to manually place the Source Object using the *Local Position* and *Rotation* parameters.
- **Closest Point:** By default the closest point on the **Source Object** to the **Target Object** will be used to position the **Source Object** on top of the **Target Object**'s surface.
- **Center:** The center of the **Source Object**'s geometry will be used to place it on the surface of the Target Object, so the **Source Object** will be 'inside' the **Target Object** surface.

Fig. 28: The Source Object can either be projected onto the surface using its closest part or its center.

2.3.4 Gradient Effect

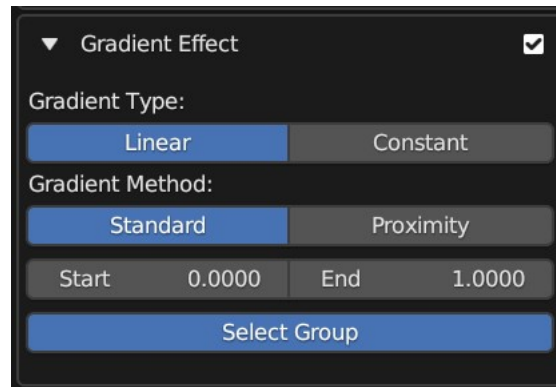
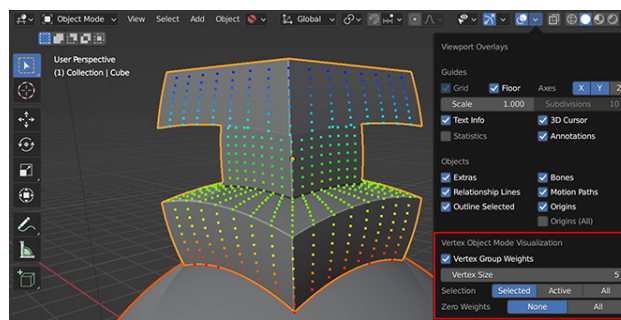


Fig. 29: The expanded Gradient Effect Panel.

The Gradient Effect creates a vertex group which automatically adds weighted values to the vertices at the bottom of the **Source Object** so the effect is less exaggerated at the top:

Fig. 30: The Gradient Effect allows you to control where the Source Object is deformed. In this case, we do not want the threads of the screws to be affected, so we reduce the *End* parameter so that the effect finishes towards the bottom of the object.

Tip:



View the *Vertex Groups* used by the Gradient Effect whilst using the add-on with *this additional feature*.

Gradient Type

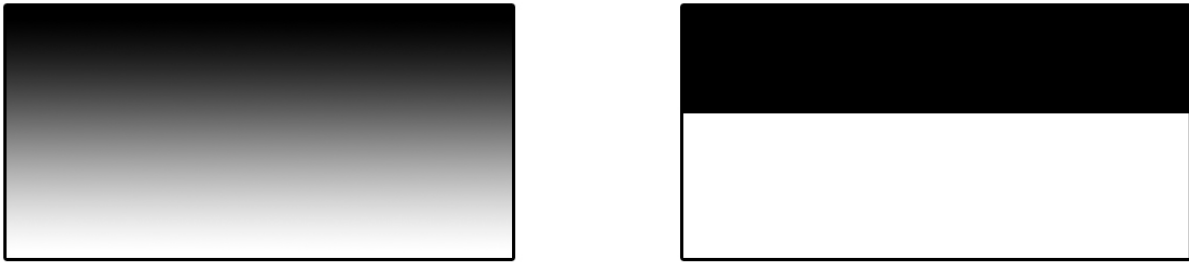


Fig. 31: The type of gradient to apply: *Linear* (Left), or *Constant* (Right)

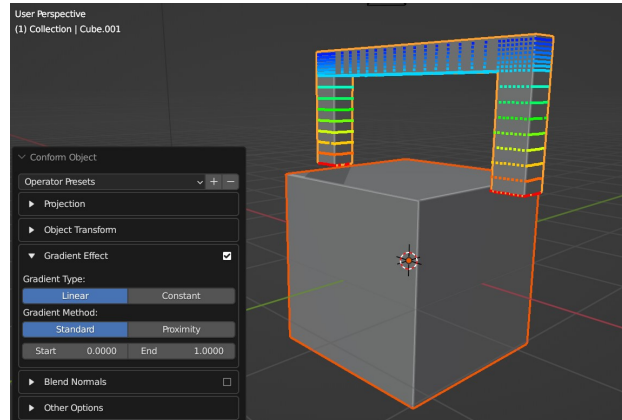
This setting determines which style of gradient effect to apply:

- **Linear:** this will create a gradually decreasing effect between two values.
- **Constant:** this will create a hard falloff from 1 to 0.

Gradient Method

This controls the method used to apply Vertex Group weights in the Gradient Effect:

- **Standard:** By default the weighting will be strongest at the closest points on the Source Object to the Target Object.:



- **Proximity:** The weighting will be strongest for vertices that are nearest the Target Object surface. This is useful when attempted to set up objects that ‘wrap’ more to the Target Object when using *Shrinkwrap Mode*.

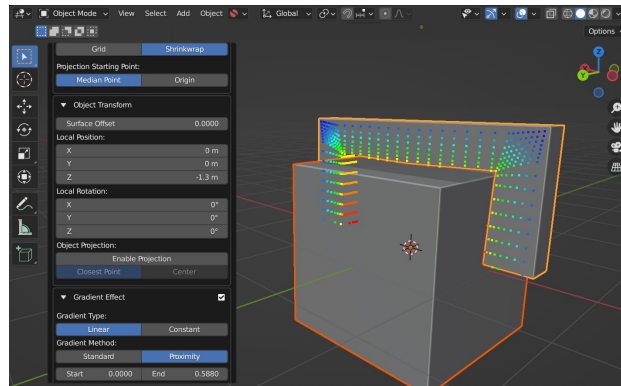


Fig. 32: Here the proximity gradient effect is applied, where projection has been disabled and instead the object has been positioned using local controls. Instead of *Grid Mode*, *Shrinkwrap Mode* is being used instead. This helps wrap objects more, but may need adjusting manually after the Conform Object operation is performed.

Start/End



Fig. 33: Start/End controls

This controls when the gradient effect of the vertices starts and ends.

A value of 0.0 is at the bottom of the object, and a value of 1.0 is at the top.

Lowering the value of the *end* below 1.0 will stop the deformation towards the bottom of the object, and higher values will extend the weight beyond the top of the object. Increasing the *start* value will start the weighting higher up the object.

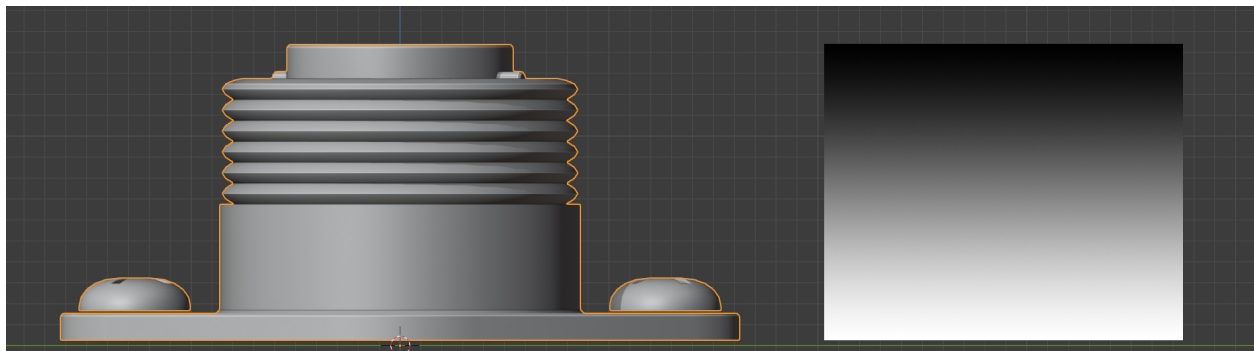


Fig. 34: The default vertex group weighting, where the effect is gradually reduced towards the top (Start=0.0, End=1.0)

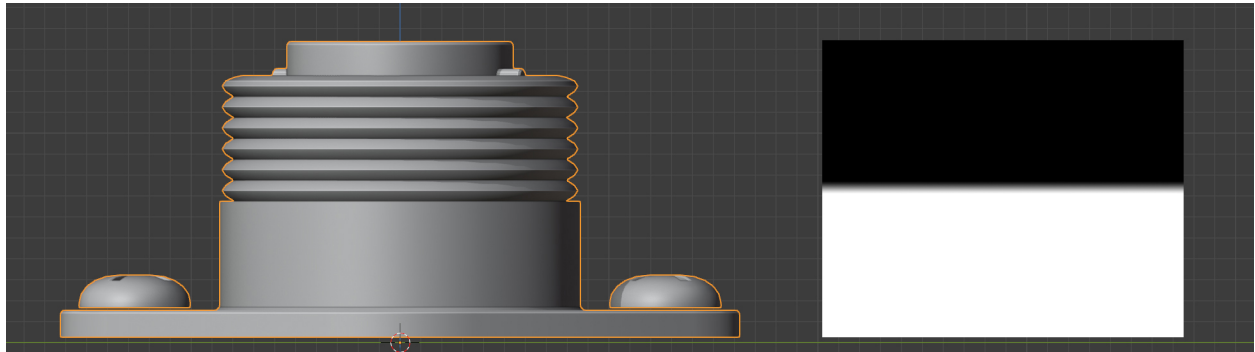


Fig. 35: Vertex group weighting where the start point has been increased so the effect covers the lower part of the object entirely (Start=0.45, End=0.55)

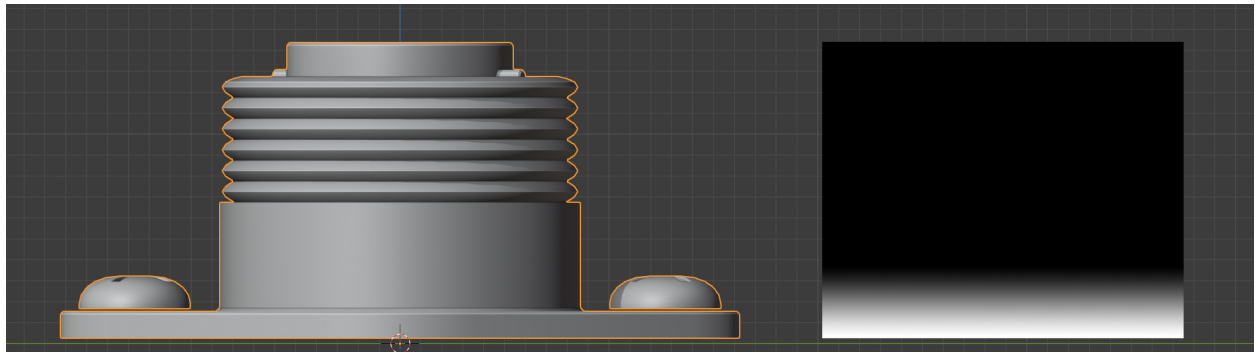


Fig. 36: A lower vertex group weighting, where the effect is gradually reduced further towards the bottom (Start=0.0, End=0.1)

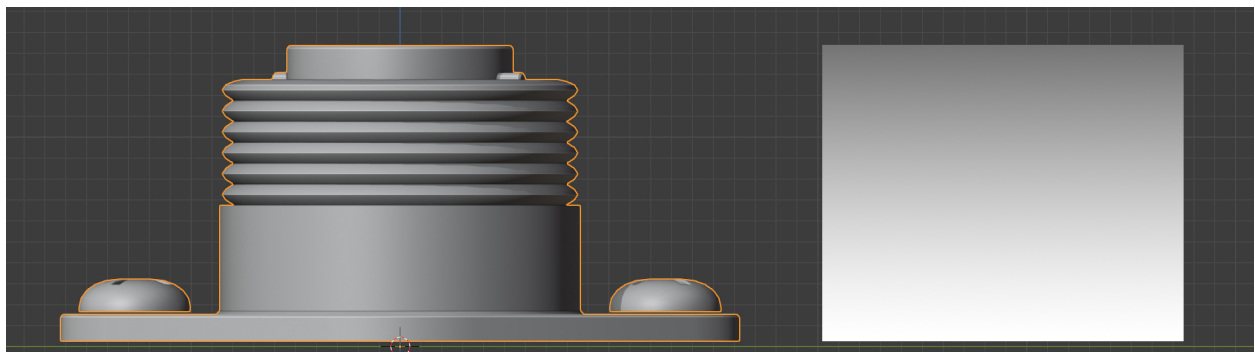


Fig. 37: A higher vertex group weighting, where the effect is gradually reduced beyond the top of the object (Start=0.0, End=2.0)

2.3.5 Blend Normals

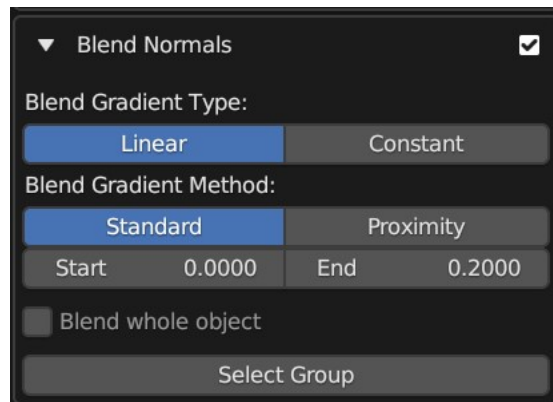


Fig. 38: The expanded Blend Normals Panel.

This will blend the normals of the source object with the target object, creating a smoother transition between the two object surfaces:

This effect is achieved by using a on the Source Object, and uses the same Blender Vertex Group weighting to control the effect in the same way as the *Gradient Effect* above.

Gradient Type (Blend Normals)

As with the *Gradient Type* controls for the *Gradient Effect*, this controls which face normals are affected.

Gradient Method (Blend Normals)

As with the *Gradient Method* controls for the *Gradient Effect*, this controls which face normals are affected.

Start/End (Blend Normals)

As with the *Start/End* controls for the *Gradient Effect*, this controls which face normals are affected.

Blend Whole Object

This will blend all of the object's normals regardless of the gradient effect.

2.3.6 Other Options

Add Simple Subdivisions

This adds a to the source object, set to 'simple', in case you wish to quickly subdivide the mesh when conforming the object.

- **Subdivisions:** The number of subdivisions to use in the modifier.

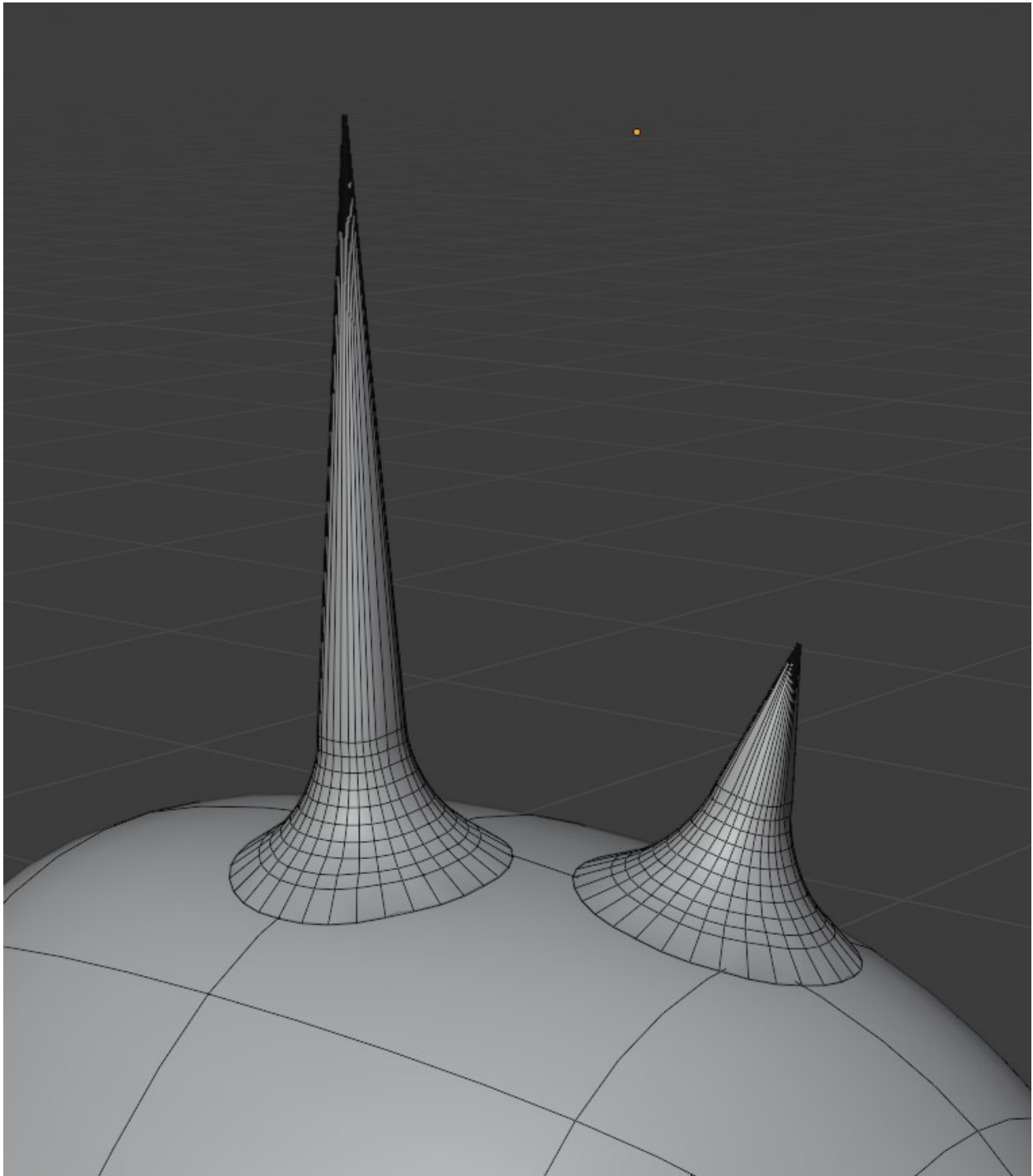


Fig. 39: Some simple ‘horns’ applied using the add-on. They are all separate objects.

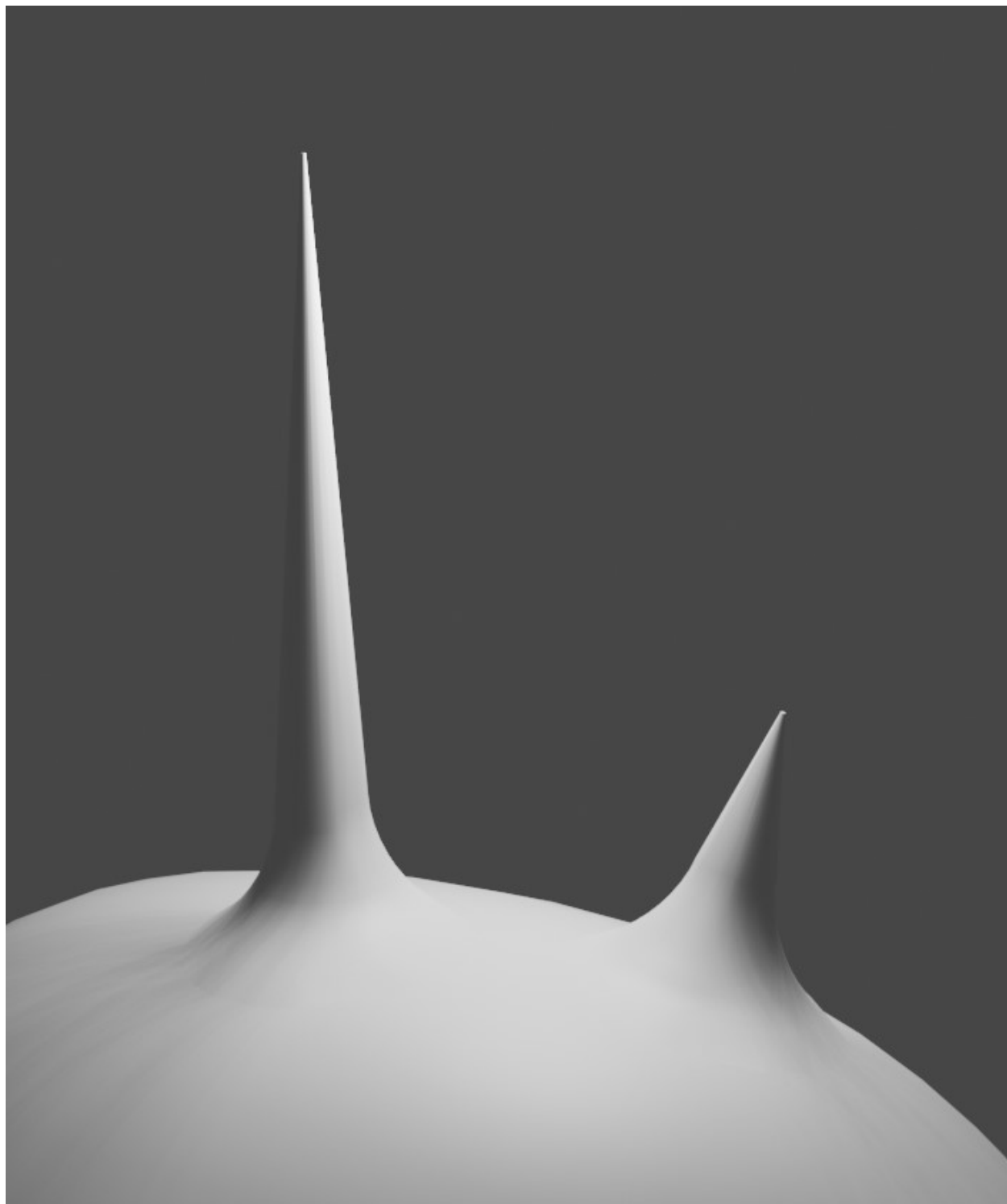


Fig. 40: Here the normals of the same 'horn' objects are blended with the normals of the head. They remain separate objects.

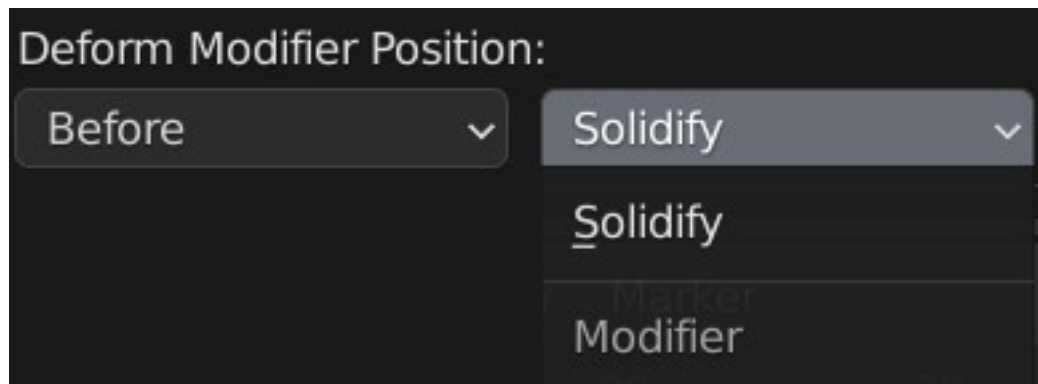
Collapse Modifiers

This will collapse the existing modifiers on the source object if they are interfering with the conform effect.

Deform Modifier Position

This will change the position of the deformation modifier (Either *Surface Deformation* or *ShrinkWrap*) on the source object:

- **Start:** At the start of the modifier stack.
- **Before:** This will place the modifier just before a specified modifier. Selecting the option will allow you to specify which modifier.



- **End:** At the start of the modifier stack.

Parent Source Object to Target Object

Assign the Target Object as the parent of the Source Object.

Warning: Parenting the Target Object cannot be automatically undone by the add-on

2.4 Undo

Fig. 41: Undo the conform operation.

If you wish to undo the operation:

1. Select the Source Object
2. Right-click and select the **Conform Object** context menu.
3. Select the **Undo Conform** option.

This will remove all modifiers and vertex groups that may have been created during the operation.

2.5 Apply

Fig. 42: Apply the conform operation. This will apply the modifiers, remove the vertex groups and the hidden deformation grid.

If you wish to edit the conformed object after it has been deformed, the **Apply Conform** operation will apply all related modifiers, delete the grid object, and remove the vertex groups all in one click:

1. Select the Source Object
2. Right-click and select the **Conform Object** context menu.
3. Select the **Apply Conform** option.

This will remove all modifiers and vertex groups that may have been created during the operation.

2.6 Surface Snapping

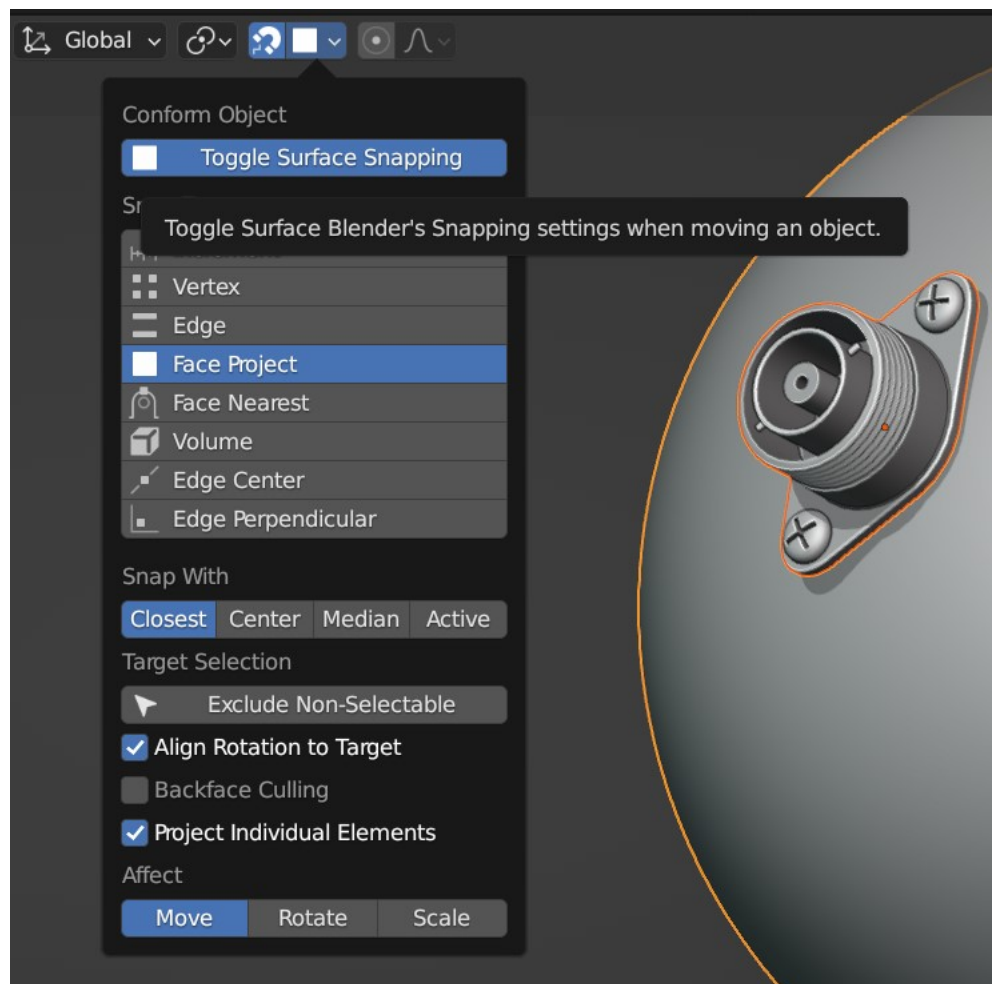


Fig. 43: The Toggle Surface Snapping option automatically enables surface snapping.

Fig. 44: Object being snapped to a face while moving.

To align an object to another object's surface, a common set up in Blender is to enable the relevant snap options in the *Snapping* menu in the top middle of the viewport. To quickly switch on these settings, an option is provided in the menu that allows you to toggle these settings on and off.

With the add-on installed, you can either:

1. Expand the *Snapping* menu at the top of the viewport.
2. Under *Conform Object*, Click the **Toggler Surface Snapping** option to enable or disable it.

Or:

1. In the viewport, right-click and select the **Conform Object** context menu.
2. Select the **Toggle Surface Snapping** option.

Both these options will automatically enable snapping so that you can align the object to the surface quickly.

2.7 Visualize Vertex Weights

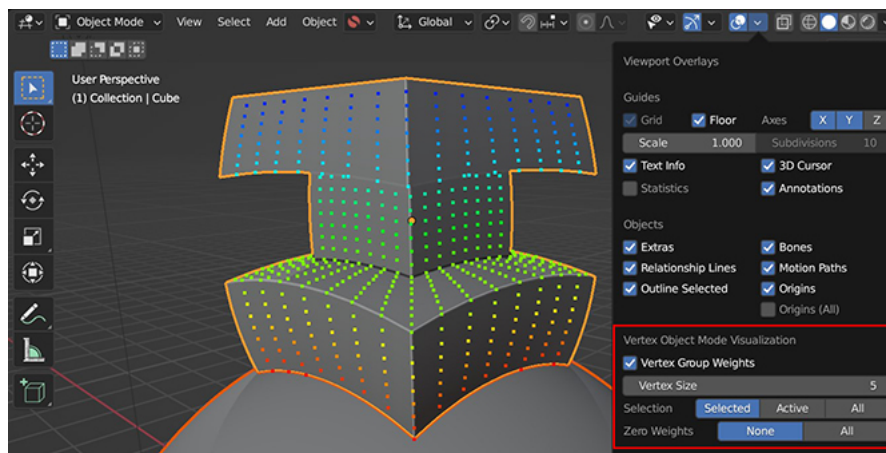


Fig. 45: The add-on adds an option to the *Overlays* menu that allows you to visualize vertex weights in Object Mode.

In Blender you do not currently have the option to see Vertex Weights in Object mode, only in Edit Mode. When the add-on is installed, to help you understand the *Gradient Effect* we have included an extra tool for you to do this.

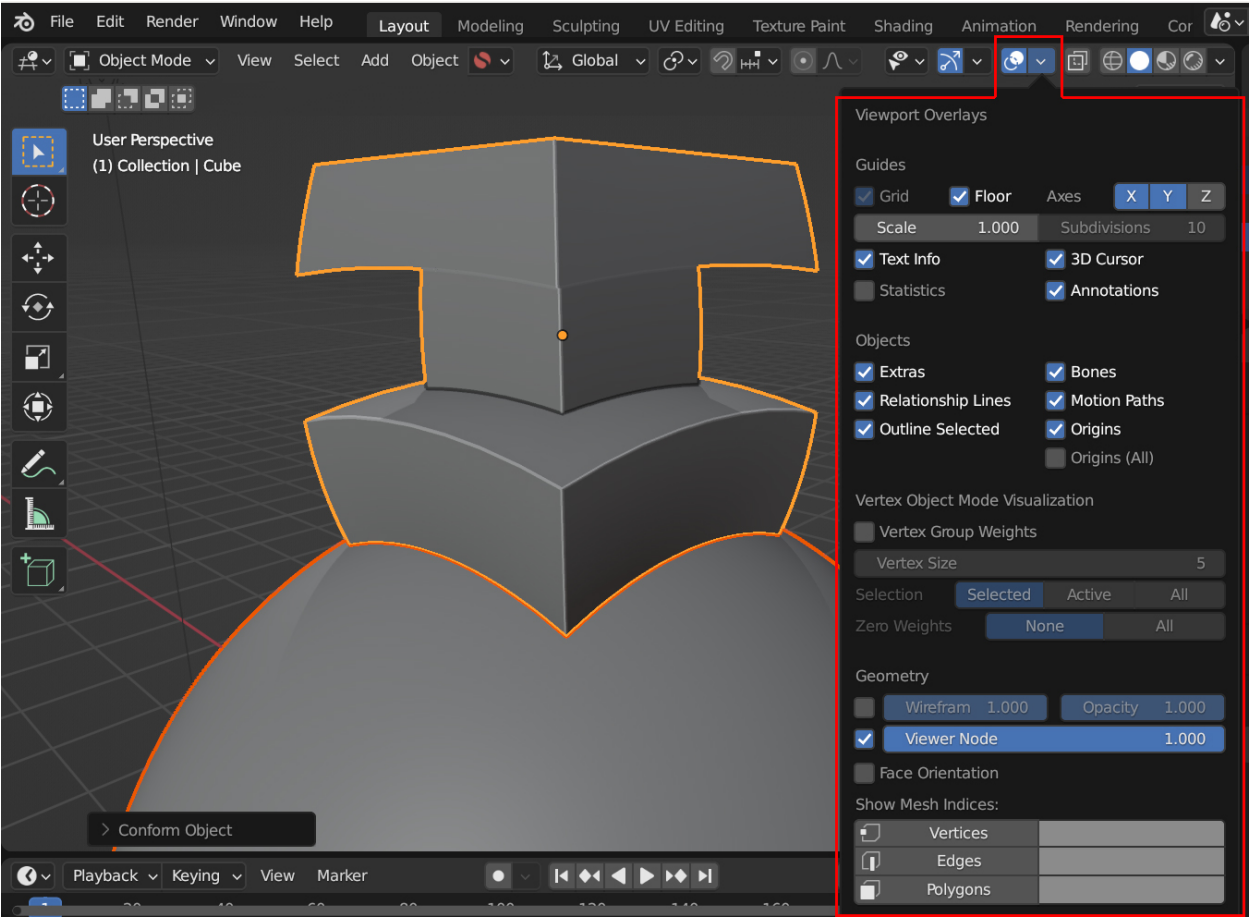
Strongly weighted vertices will be shown in red, medium weights are shown in green, and zero weighted vertices are shown in blue.

This tool is not tied to Conform Object and can be used to visualize any active Vertex Group on any object.

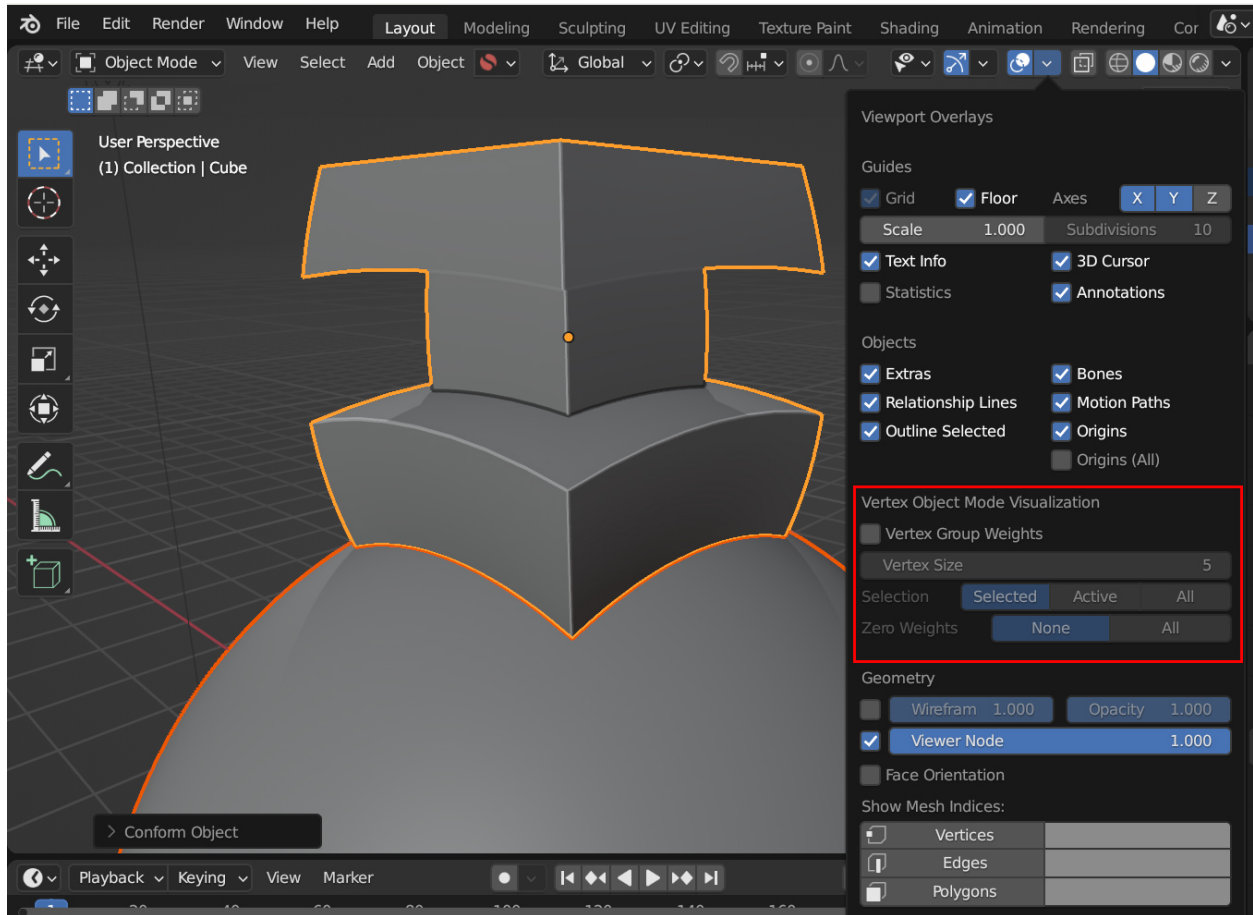
Warning: Be careful with more complex objects with lots of vertices, as this will slow the viewport down significantly.

To enable the tool:

1. In Blender's viewport, go to the *Show Overlays* menu in the top right:



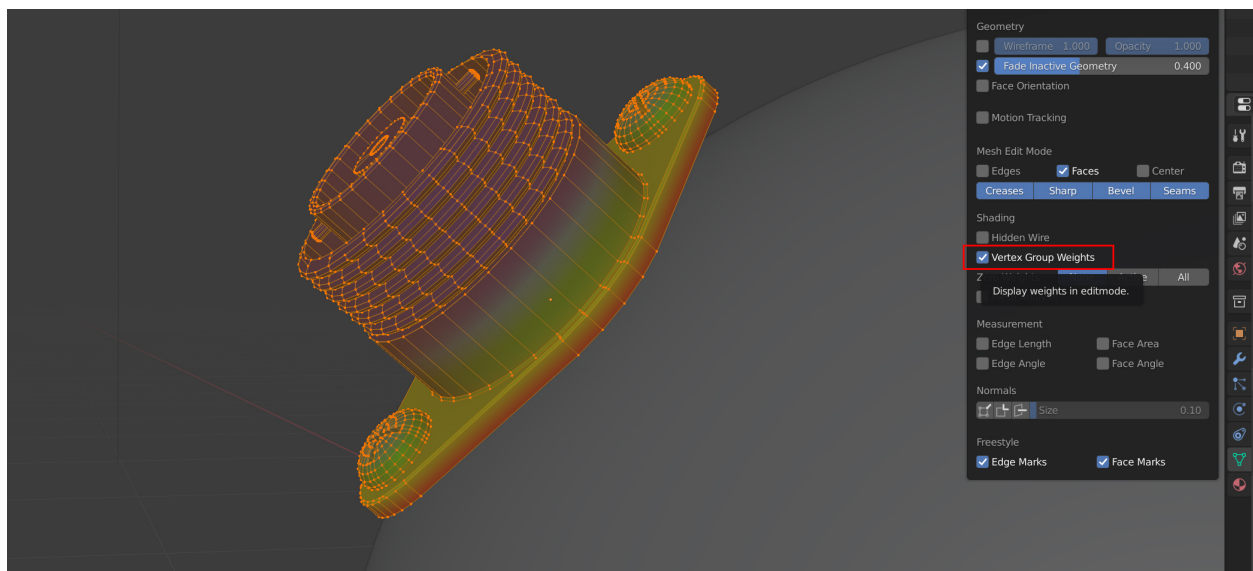
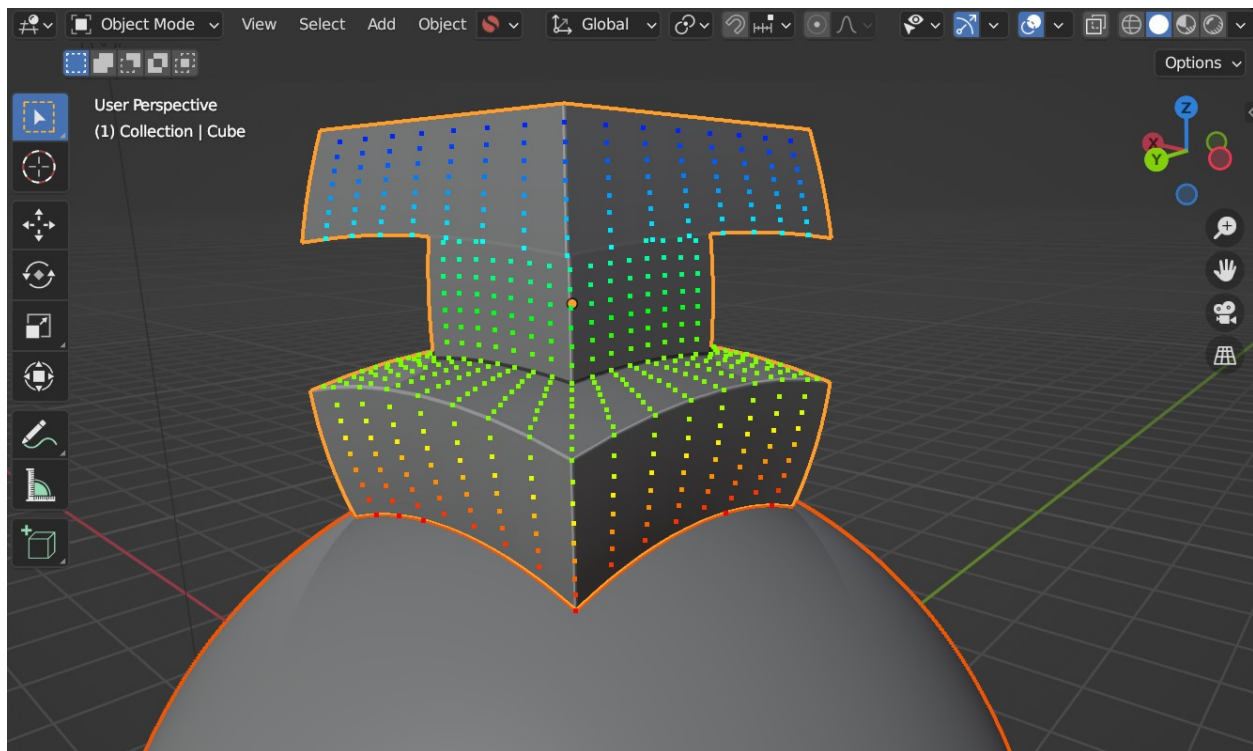
2. If the add-on is installed you should see a “Vertex Object Mode Visualization” section:



3. In this section, tick the box next to “Vertex Group Weights”. Now, any selected object with active Vertex Groups should have their weights displayed:

Tip: If you want to change which Vertex Group is visualized, change the active Vertex Group by selecting another Vertex Group in the *Object Data Properties* panel:

Tip: Visualise a vertex group in Edit Mode by selecting “Vertex Group Weights” in the overlays panel:



2.7.1 Vertex Visualization Options

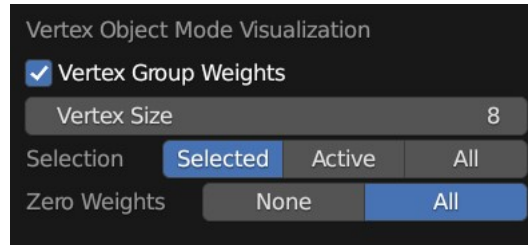


Fig. 46: The options in Blender’s Viewport Overlays panel.

Vertex Size

The size of each vertex point in the viewport display.

Selection

Which vertex groups to display:

- **Selected:** Only display Vertex Groups on selected objects.
- **Active:** Only display Vertex Groups from the Active object.
- **All:** display Vertex Groups on all objects.

Zero Weights

Control how zero weighted vertices are displayed (useful for more complex objects):

- **None:** Do not display vertices with zero weights.
- **All:** Display all vertices even if they have zero weights (displayed in blue).

2.8 How does it work?

The add-on has two modes; *Grid Mode* (default) and *Shrinkwrap Mode*.

The manual processed for both has been best described in but is also described below.

2.8.1 Grid Mode

- **Advantages:**
 - More accurate: it positions the source object vertices in the same direction as the faces of the target object.
- **Disadvantages:**
 - More complex: adds an extra helper grid object to the scene.
 - If the source object is edited or copied, you will need to re-apply the operation.

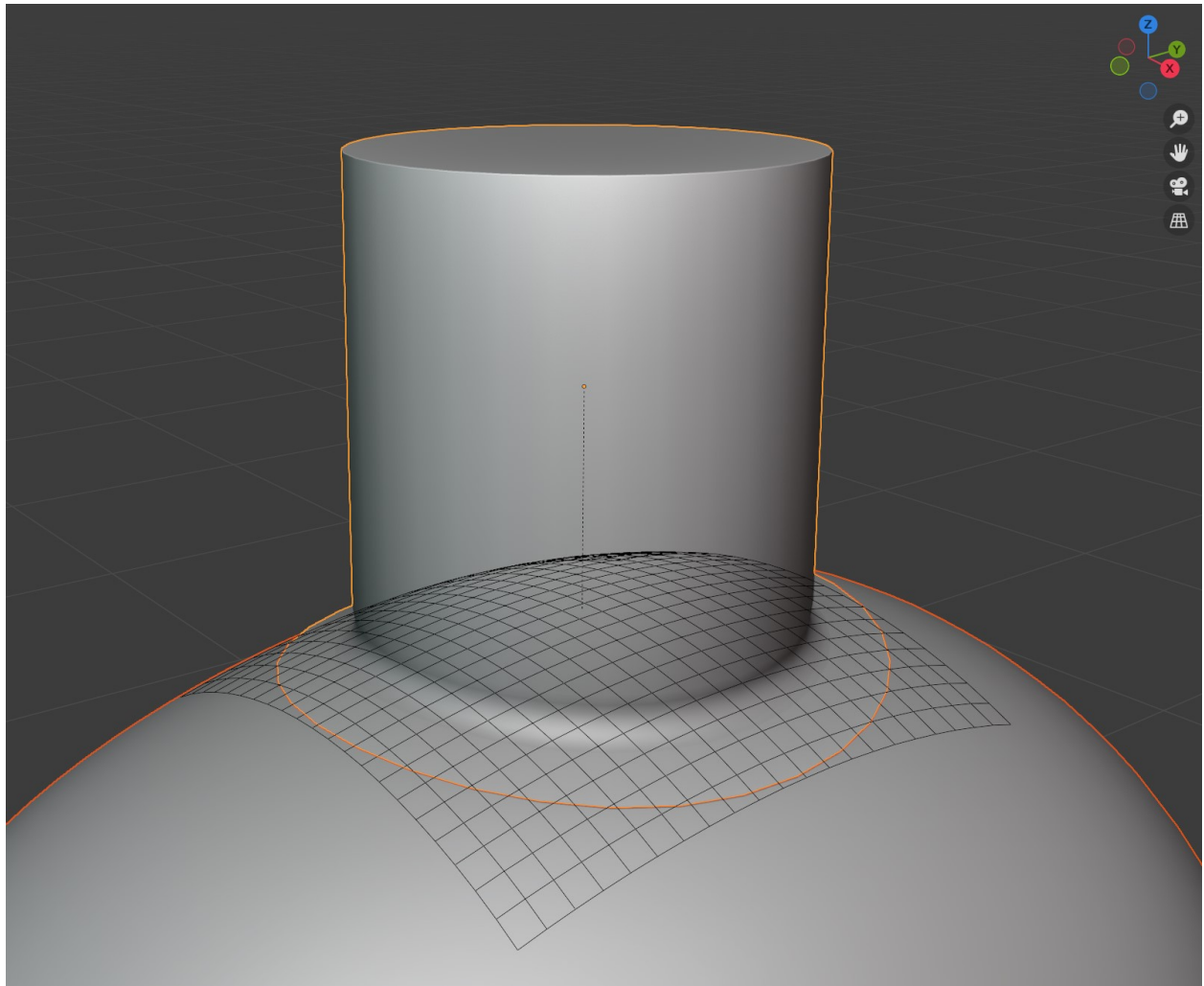


Fig. 47: The add-on in Grid Mode, with the grid visible.

The add-on automatically creates a deformation grid object which is used to project the object to the surface of another using a . This grid object is **hidden** by default and can have its subdivisions configured.

It automates the manual process of:

1. Creating a deformation grid and aligning it to the base of the object.
2. Adding a and associating it with the Grid.
3. Adding a to the grid and associating it with that object.
4. Adding a weighting to the object from the bottom to the top to control *the influence of the deformation*.

The deformation grid is automatically deleted if the source object is deleted.

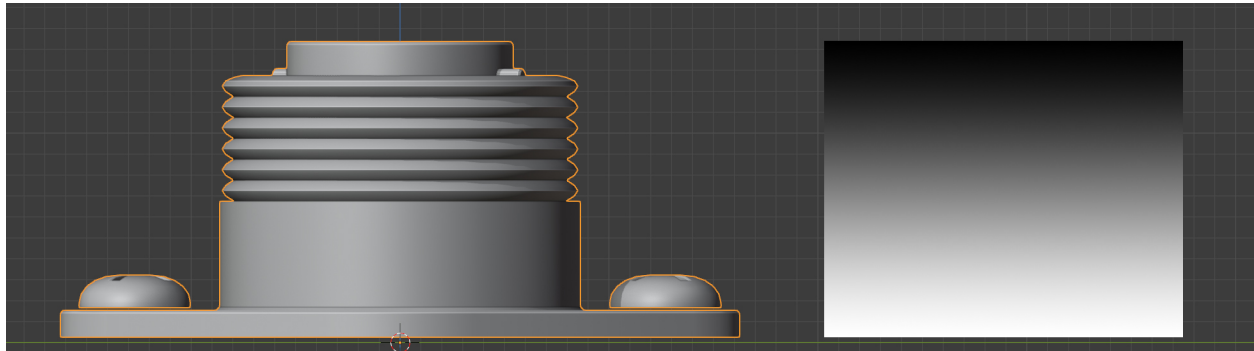


Fig. 48: The default vertex group weighting.

2.8.2 Shrinkwrap Mode

- **Advantages:**
 - Simpler, only a is added to the target object.
 - You do not need to re-run the operation when the object is edited.
- **Disadvantages:**
 - Not as accurate; does not align vertices
 - It will flatten the lower parts of the object in many cases.

For the shrinkwrap modifier mode, it automatically:

1. Adds a to the mesh.
2. Adding a weighting to the object from the bottom to the top to control *the influence of the deformation*.

2.9 Tips and Troubleshooting

If you are having any issues do not hesitate to [Contact Us](#)

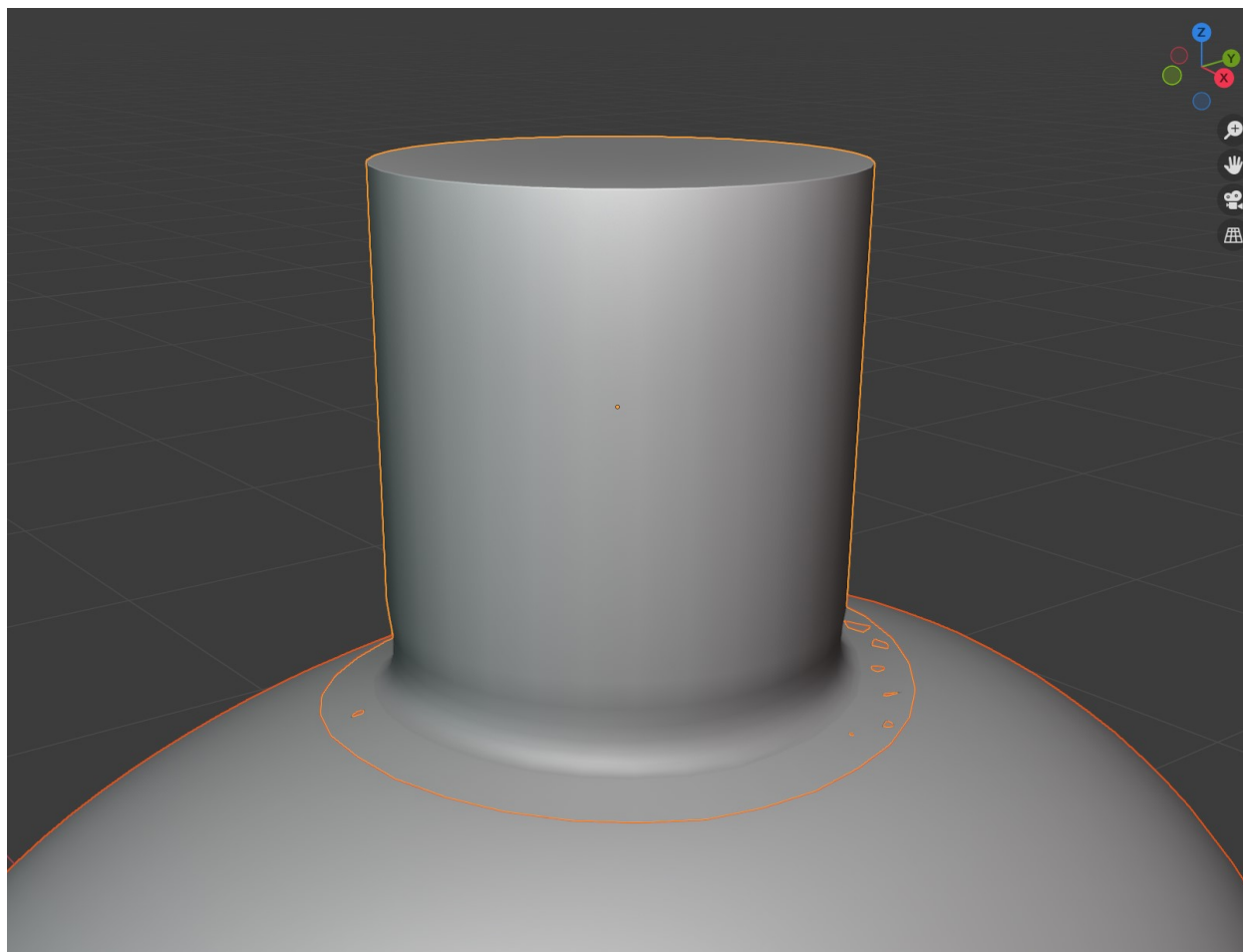


Fig. 49: The add-on in Shrinkwrap Mode.

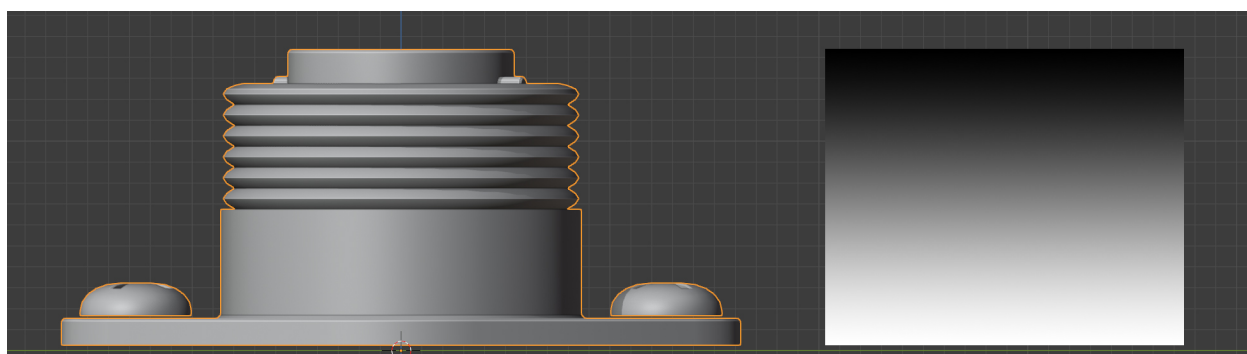


Fig. 50: The default vertex group weighting.

2.9.1 My Source Object has not aligned correctly to the Target Object

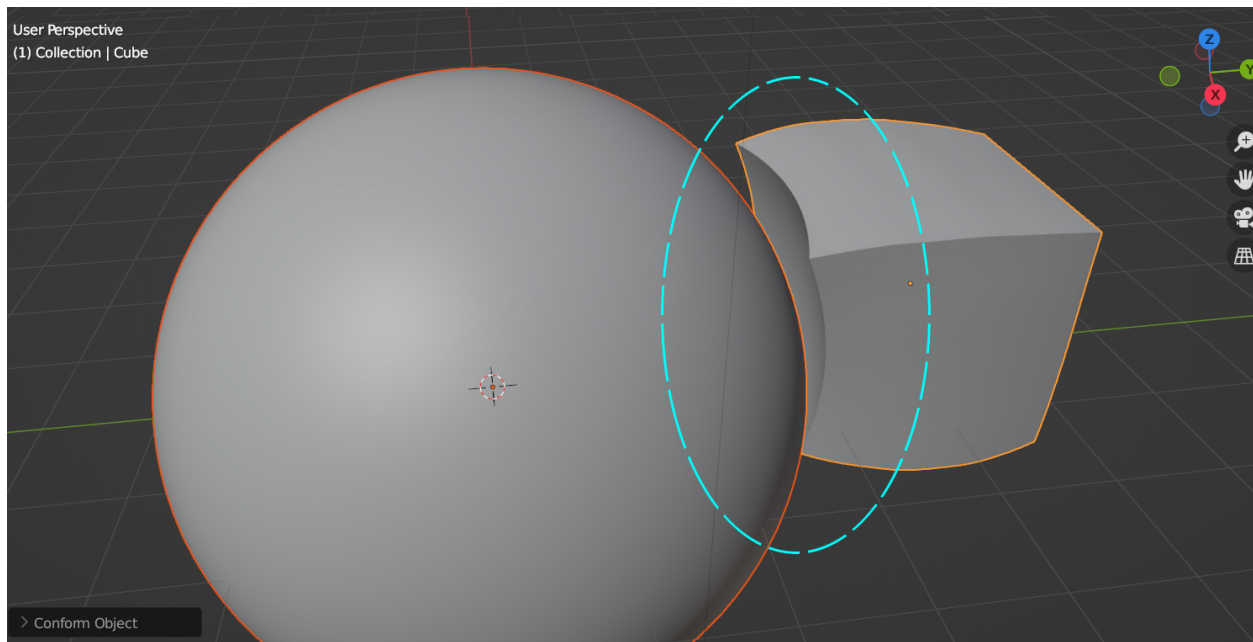


Fig. 51: A gap is showing where the Source Object is not aligned well to the Target Object.

This happens when the projection of the **Source Object** is not directly pointed at the **Target Object**. To fix this, during the Conform Object operation expand the *Object Transform* section of the left hand side panel. Adjust the *Local Rotation* parameters until the **Source Object** is aligned to the **Target Object**:

Fig. 52: The Local Rotation parameters are used to correctly align the Source Object.

2.9.2 I lose the Options menu when I click off the panel. How do I get it back?

In Blender this type of operation is very “one way”, however if the Conform Object operation was the last operation you performed, select the **Source Object** and then the **Target Object** again and press **F9**. The menu should re-appear again. Please note you will need to select the Source Object and then the Target Object in this way *before* pressing F9, otherwise the add-on will not re-do the operation even though the panel will re-appear.

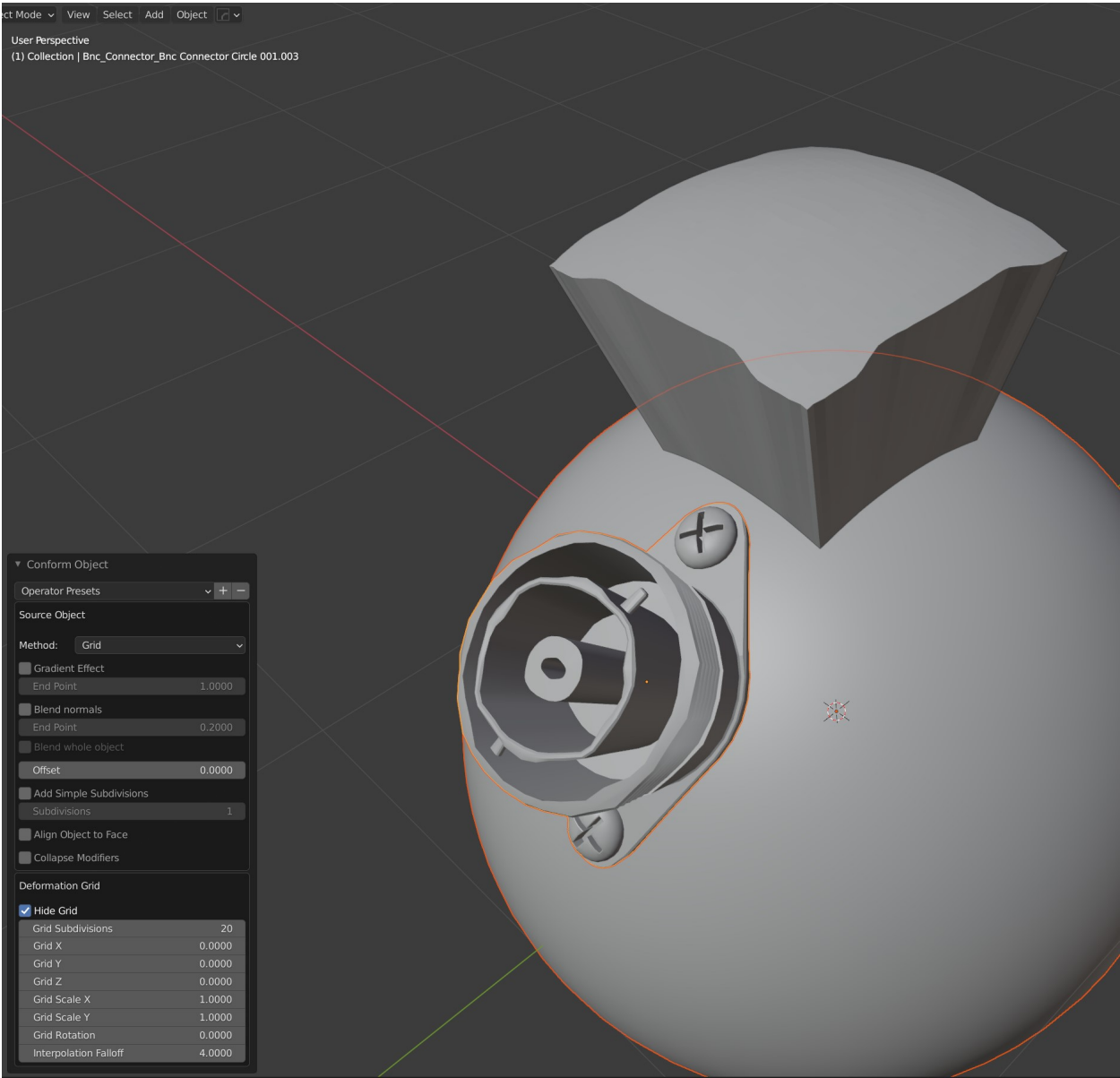
2.9.3 Bad Deformations

This can occur for several reasons:

- Not enough topology (vertices, faces) on the source of the Target Object.
- The tops of the object look best when the effect is not as strong.
- The meshes need more subdivision.

There are several things to try:

- Enable the *Gradient Effect* to smooth the deformation at the top of the object.
- Increase the resolution of the Target Object by using a subdivision surface modifier.



- Increase the *Grid Smoothing* of the deformation grid in the *options* panel.

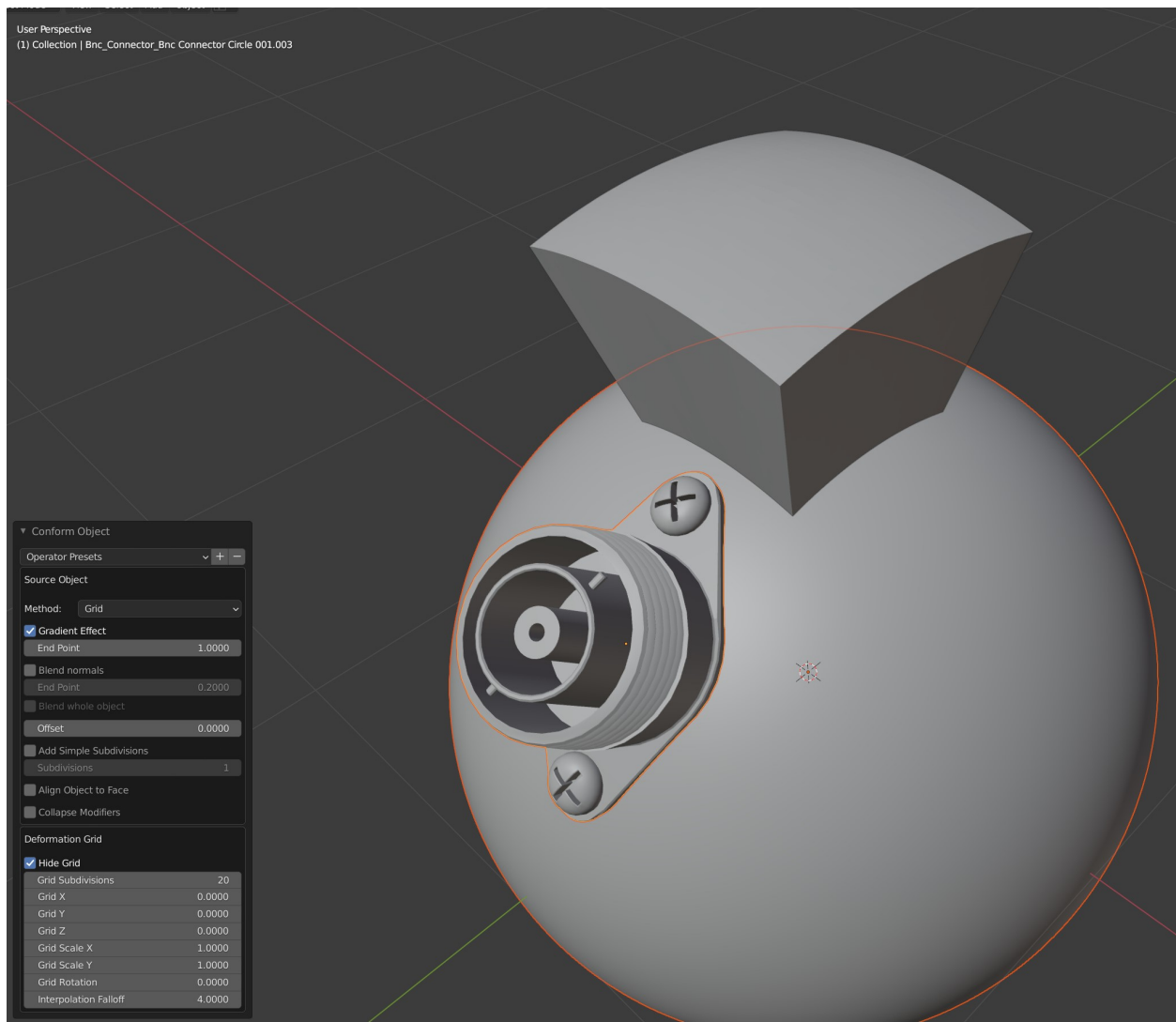


Fig. 53: Here, the target sphere object's resolution was increased using a subdivision surface modifier, and the *Gradient Effect* was enabled for the screw part to lessen the effect at the top.

2.9.4 When Editing the Object, the Effect is Lost

2.9.5 When Copying the Object, the Effect is Lost

2.9.6 The Object does not render with the deformation on it.

This can happen when a modifier like the Subdivision Surface modifier on the Source Object does not have the same *Render* level settings as its *Viewport* render settings:

Blender uses the *Viewport* setting to calculate the deformation, so it will not bind at render time if the *Render* setting is different.

Fig. 54: The effect gets lost when editing the object.

- In *Grid Mode*, the loses its binding to the surface whenever the underlying mesh is changed.
To fix this, select the **Source Object** and the **Target Object** and *run the conform operation again*. This will re-apply the modifiers and update the binding.

Fig. 55: The effect gets lost when duplicating the object.

- In *Grid Mode*, because the new object would reference the same deformation grid, the effect is automatically removed by the add-on to prevent this.
To fix this, select the **Source Object** and the **Target Object** and *run the conform operation again*. This will re-apply the modifiers and update the binding.

To fix the issue, set the *Render* level setting to be the same number as the *Viewport* level setting. This should allow you to render the Source Object with the deformation.

2.9.7 When I Click ‘Apply Conform Object’, the object jumps.

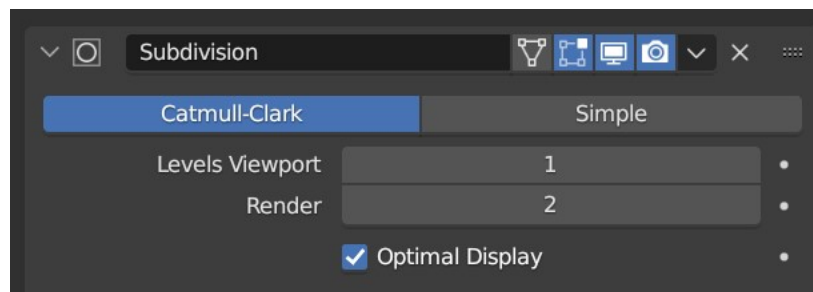
Try applying any modifiers that are above the Conform Deformation modifier using the drop down box on each modifier for the source object, and then for the Conform Deformation modifier use the ‘Apply Conform Object’ operation. If you are still having issues *send us a message*.

2.9.8 Creating Boolean Cutters

If trying to use the conformed object as a boolean cutter on the Target Object, use the *Apply Conform Object* operation first which will apply all the modifiers - otherwise, Blender will go into a loop where it is trying to use the object to cut, but then the Source Object itself is trying to deform to the cut shape.

2.9.9 My Source Object distorts badly when I change Object Transform Settings

This may be because you need to Apply Object Scale to the object by pressing F3 and searching for *Apply Scale*. Blender modifiers sometimes do not work well if the object scale is not applied i.e. reset to (1.0, 1.0, 1.0).



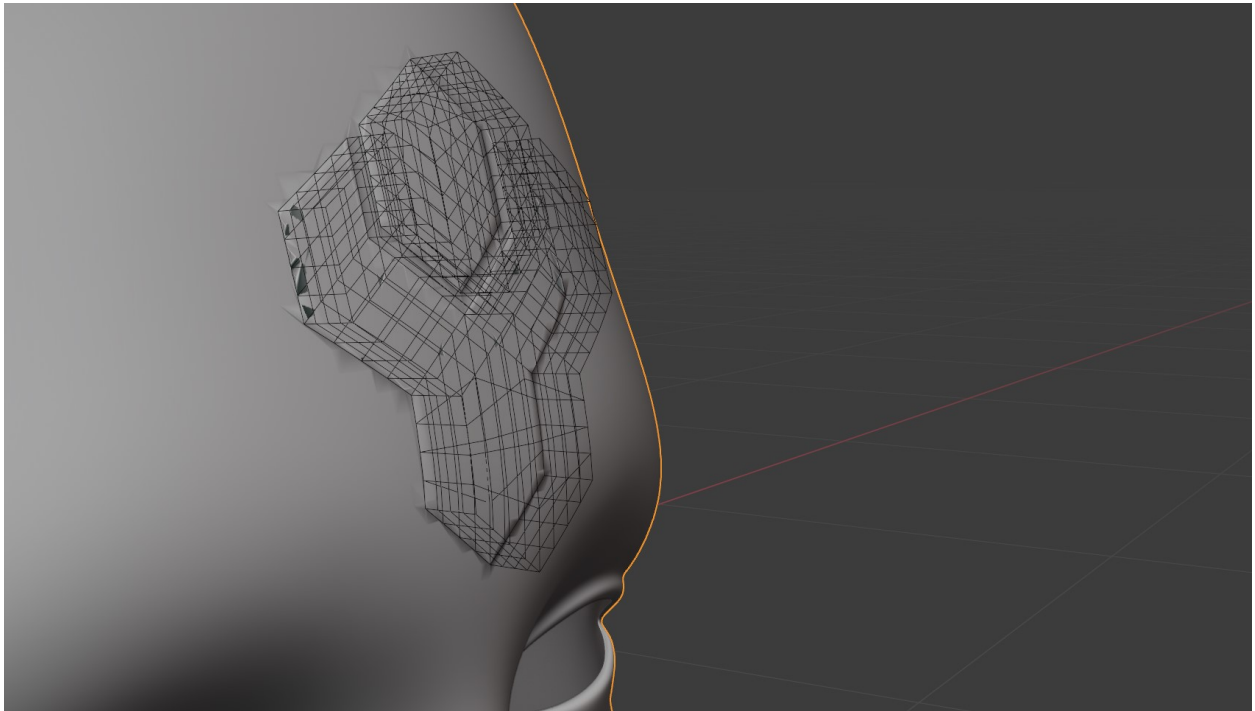


Fig. 56: Example of a bad boolean cutter because Conform operation is not *applied*.

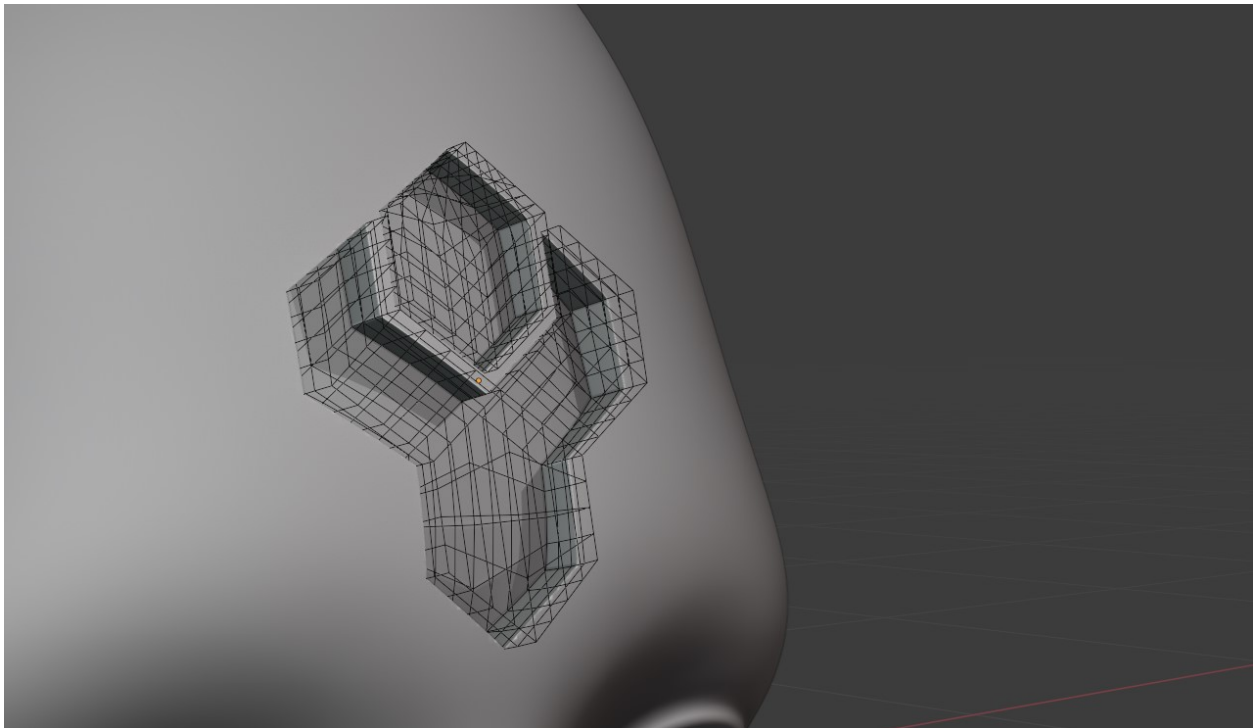


Fig. 57: Remember to *apply* the Conform Object operation to the Source Object before using as a boolean cutter.

2.9.10 When I click off the panel, I lose my settings

This is an unfortunate effect of Blender's one-time operation that the settings are applied just once, and the panel is easily lost. You can *re-run the operation* and the modifiers will be replaced, not re-added. Pressing F9 may bring back the panel, but the settings will not be applied again.

2.10 Contact

If you have a question, issue, or new feature idea do not hesitate to get in touch via info@configure.net.

2.11 Indices and tables

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- [modindex](#)
- [search](#)