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What’s new in version 2

Nodal workflow and faster computations:
With version 2, Hard Mesh becomes node based instead of command based. This means that you can always edit your meshes and the HardMesh result will always be updated, until you decide to delete the history of your output meshes.

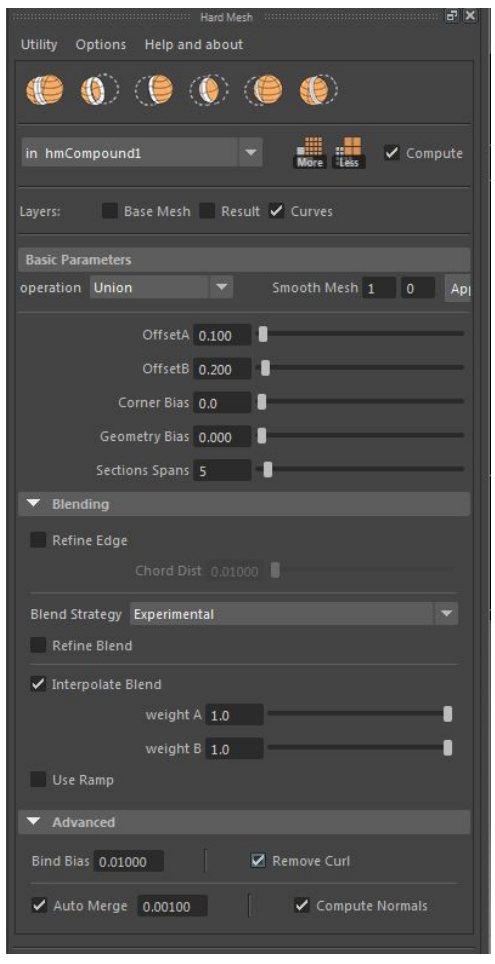
New auto installation directly from Maya:
The version 2 introduces a new auto-install function allowing the user to auto install the plugin directly from Maya.

How to use it:

1. Unzip/unrar the HardMesh archive anywhere on your system.
2. Open the supported Maya version that you will use hard mesh with, go to the folder where you have unpacked HardMesh and open the hardMesh_auto_install.ma. It’s important to open it, no drag and drop.
3. Maya will show you a new window with the folders that will be used in the installation process. When you restart maya (if the auto load option is on) a new HardMesh menu will appear on the menu bar.

What it does:
The scene basically asks Maya where is the module folder used for searching plugins and creates it under the hmTools.mod file with the right path pointing to the location where you have HardMesh on your system. Then it adds an auto load by adding a new line in the userSetup.py file under your scripts preferences, or creating a new one if it does not exist.

New simplified UI:
The new UI provides simpler and faster HardMesh operations creations with a top section with icons, for rapid executions, and double click for setting options.
The options are shared between different operations, so for example setting a smooth level of 1 in the union operator, will also set the same smooth level on a difference operation.



The new UI.

New global compute:
When working with multiple cascades of operations it may be useful to “pause the computation” to model the input shapes better and reactivate it only when done, avoiding a lot of slow tweaking.

Custom meshes under the hood:
The current splitting algorithm is faster and more efficient providing less “unsolvable situations” during the editing. When it breaks it is 99% caused by bad curves inputted, the next step of the developing process. Now if there are 10 intersections and 2 of them give problems, the node computes just the solvable ones avoiding the stop and exit from all the computations.

Current Limitations and future developments

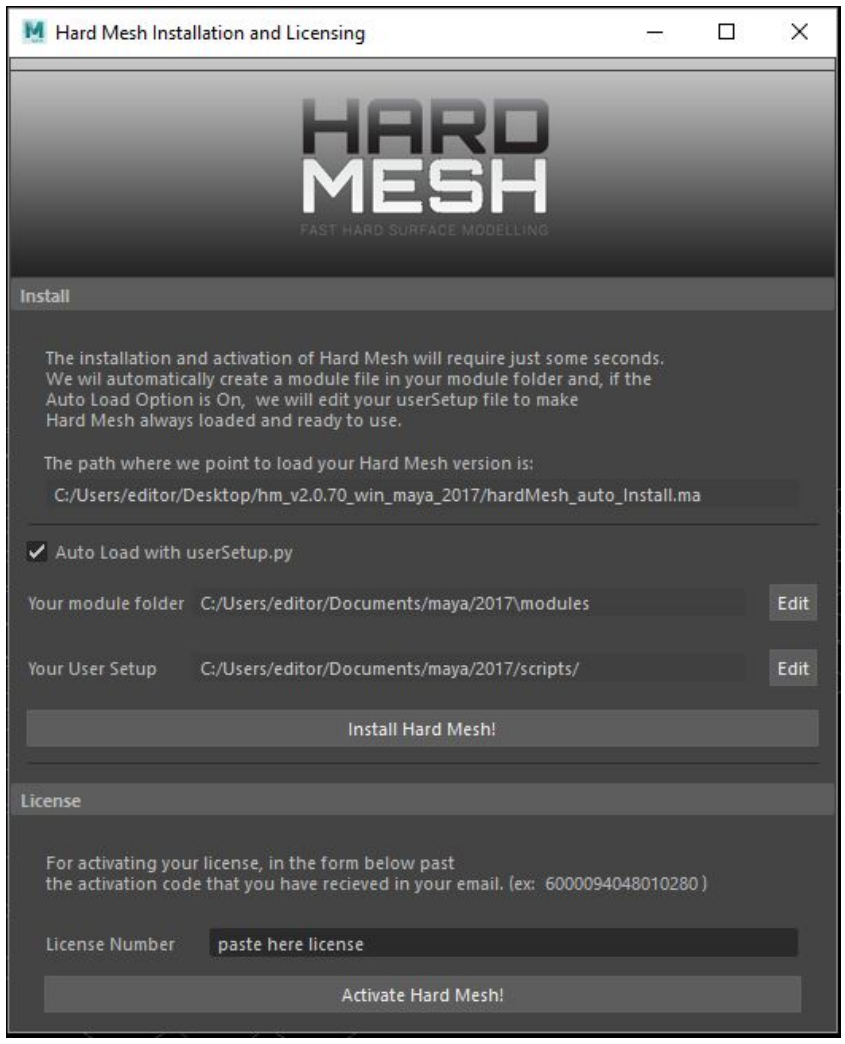
Scale of scene matters:
If you work with large scale objects the algorithms will not work. This is a known issue that will be removed in next releases.
We suggest you to work in centimeters with objects no larger than 100 centimeters.

No dynamic intersections count:
When you setup 2 meshes for an operation, you can change the shape unless you don’t create new intersections. If you start with 2 intersections you can’t end with 3 intersections, the new one will be ignored.

Simple operations:
The simple nodes for cutting from curves or for blending from edges will be released later, for giving you the ability to use some HardMesh core algorithms as standard modelling tools.

Linux and Mac Version:
It’s in our plans to deliver a Linux and a Mac version soon.

Installing Hard Mesh



The installation and licensing window

HardMesh uses the Maya modules for finding all the needed elements to work. You can leave the files wherever you prefer in your system and use the auto-install file for creating the needed .mod file. The auto install edits/creates also the userSetup python file for auto loading the plugin.

The **hmTools.mod** is usually located in: *C:\Users\<user>\Documents\maya\<version>\modules*
The **userSetup.py** is usually located in: *C:\Users\<user>\Documents\maya\<version>\scripts*

How to use it:

1. Unzip/unrar the HardMesh archive anywhere on your system.
2. Open the supported Maya version that you will use HardMesh with, go to the folder where you have unpacked HardMesh and open the hardMesh_auto_install.ma. It’s important to open it, no drag and drop.
3. Maya will show you a new window with the folders that will be used in the installation process. When you restart Maya (if the auto load option is on) a new HardMesh menu will appear in the menu bar.

What it does:
The scene basically asks Maya where is the module folder used for searching plugins and creates it under the hmTools.mod file with the right path pointing to the location where you have HardMesh on your system. Then it adds an autoload by adding a new line in the userSetup.py file under your scripts preferences, or creating a new one if it does not exist.

Manual Installation

If you prefer you can install Hard Mesh manually.
HardMesh uses the Maya modules for finding all the needed elements to work. You can leave the files wherever you prefer and create the necessary files for letting maya find it on your machine.
Then instead of activating the product with your internet connection, you can proceed to a remote activation by providing us your system mac address.

1. Unzip/unrar the HardMesh archive anywhere on your system, copy the path.
2. Go to your maya version preferences that is usually located in: *C:\Users\<user>\Documents\maya\<version>\modules*
3. Create a new text file called **hmTools.mod**
4. Make sure that .mod is the extension and not in the name of the file.
5. Open the file, and paste the following lines:
   + PLATFORM:win64 hmTools any REPLACE WITH YOUR PATH
   PATH+:=bin
6. Paste the path of the root where you have unpacked the plugin instead of the REPLACE WITH YOUR PATH string. .
7. Save the file.
8. Now when starting Maya you should find the file hmTools.mll inside the plugin manager.
9. Remember that you need to activate Hard Mesh in order to load it.

Licensing Hard Mesh

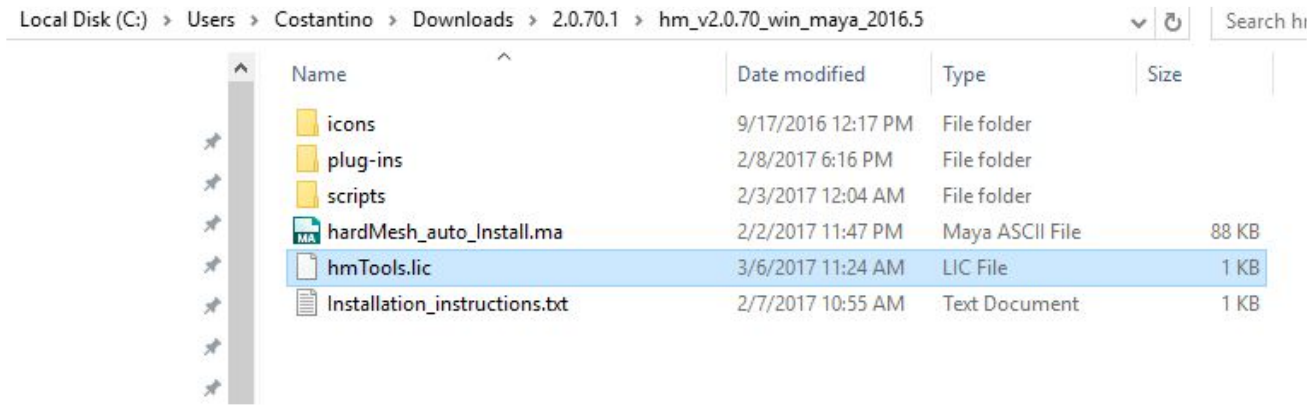
Once you have **installed HardMesh** from the installation windows, you can activate your license during the same Maya session. Simply **paste the activation code** (ex:8000101020003008) in the field provided and click on activate.
An **internet connection** is **required** for obtaining the license. Please **check** that your **windows firewall** or **anti virus** are **not blocking** maya from reaching out **our server**.
After your activation is done, you can load the plugin manually, if you didn't check the the autoload field in the installation. Otherwise, the HardMesh menu will appear in the menu bar of Maya.

Licensing on multiple Maya versions

Once you have activated the license on one Maya version, the easiest way to have Hard Mesh on every installed Maya is to just copy/paste the license file.
To do that:

- go on the root folder of the current activated version
- Copy the file hmTools.lic
- Go on the root of another Hard Mesh version
- Paste

At this point when you load Hard Mesh into another Maya version the license is already ok.



The location where the license file should be pasted.

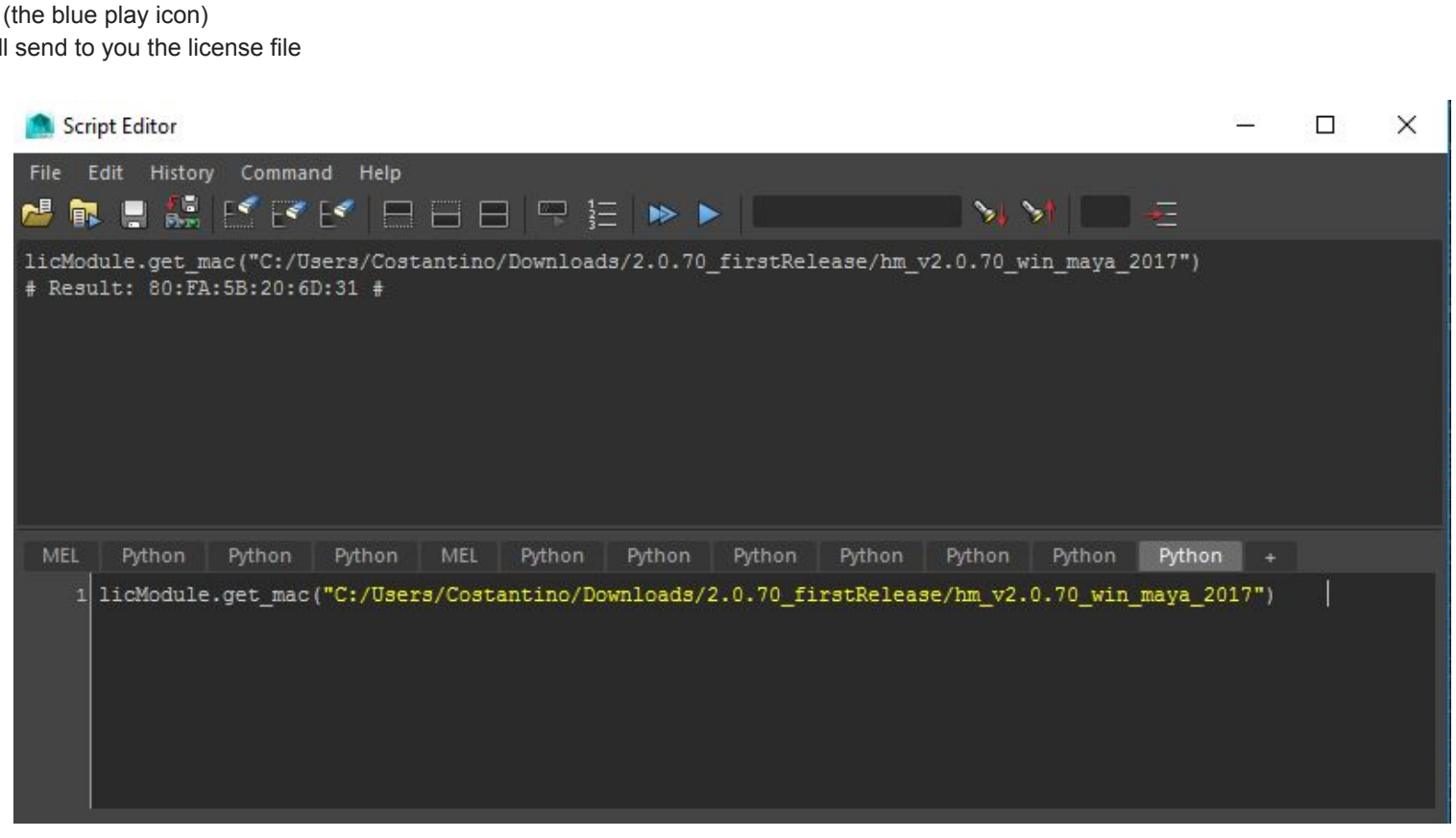
Manual Licensing

If for some reasons the computer where you will use Hard Mesh has no internet connection you can send us your mac address for a remote activation process.
For avoiding errors, is better that you use our library for getting the mac address, otherwise it could not work.
Please keep in mind that after sending to us the mac address it might take up to 48 hours for having back the license to you.

Getting the MAC address with pux library::

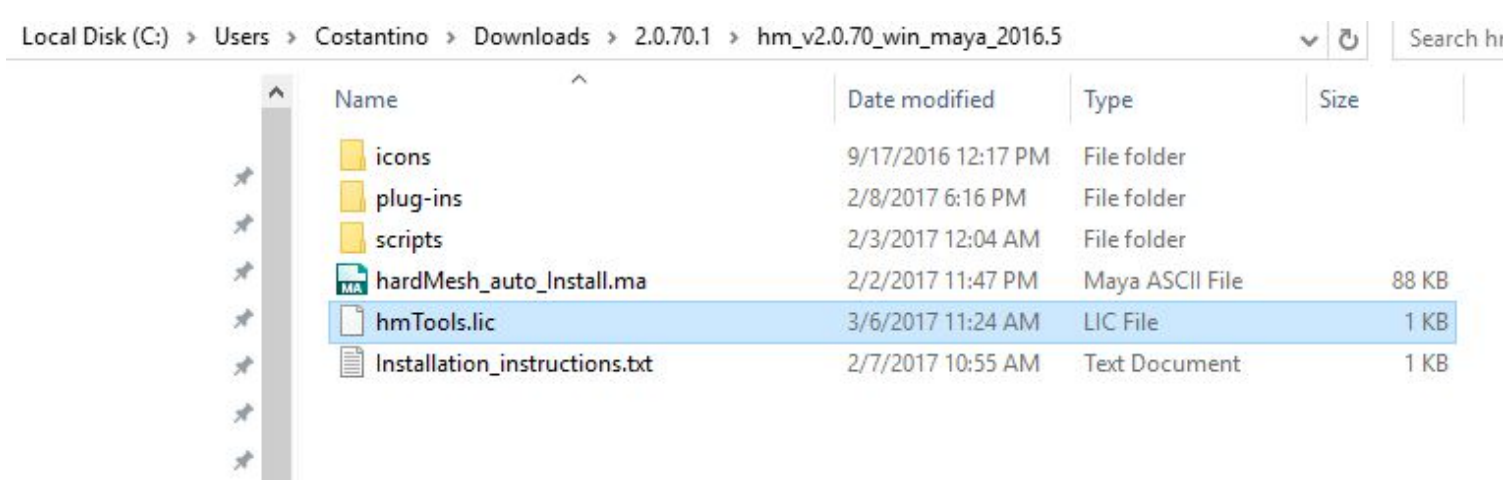
You need to give us the MAC adress, it's easy.

1) Open Maya
2) Open the installation file "hardMesh_auto_Install.ma"
3) Open the script editor and in a python tab paste:
licModule.get_mac('the path of your plugin')
4) Make sure that the slashes are **forward (this / and not this \)**
5) Click on the execute button (the blue play icon)
6) Send me the result and I will send to you the license file



Saving the license in the right place:

1) After you have recieved the email, you need to past the license file in the right place.
2) Paste it in the root Hard Mesh folder that you are using. You can use the same license for every Maya version as long as you use it on the same machine.



3) You are done. Open Maya, and load Hard Mesh. Happy modeling!

Removing Hard Mesh

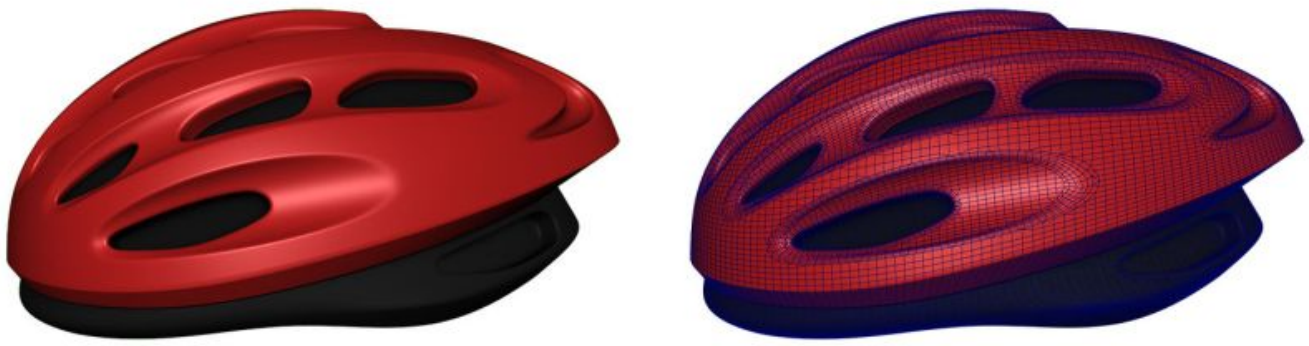
For **cleanly** removing **Hard Mesh** from your system, simply delete the file hmTools.mod located under your maya preferences folders.
If you have created the **userSetup.py** remove the following lines by opening the file in a text editor:

import maya.cmds as cmds
cmds.loadPlugin('hmTools')

You can delete the entire root folder before or after having deleted the above file and lines.
In a future update, an automatic uninstallation will be added.

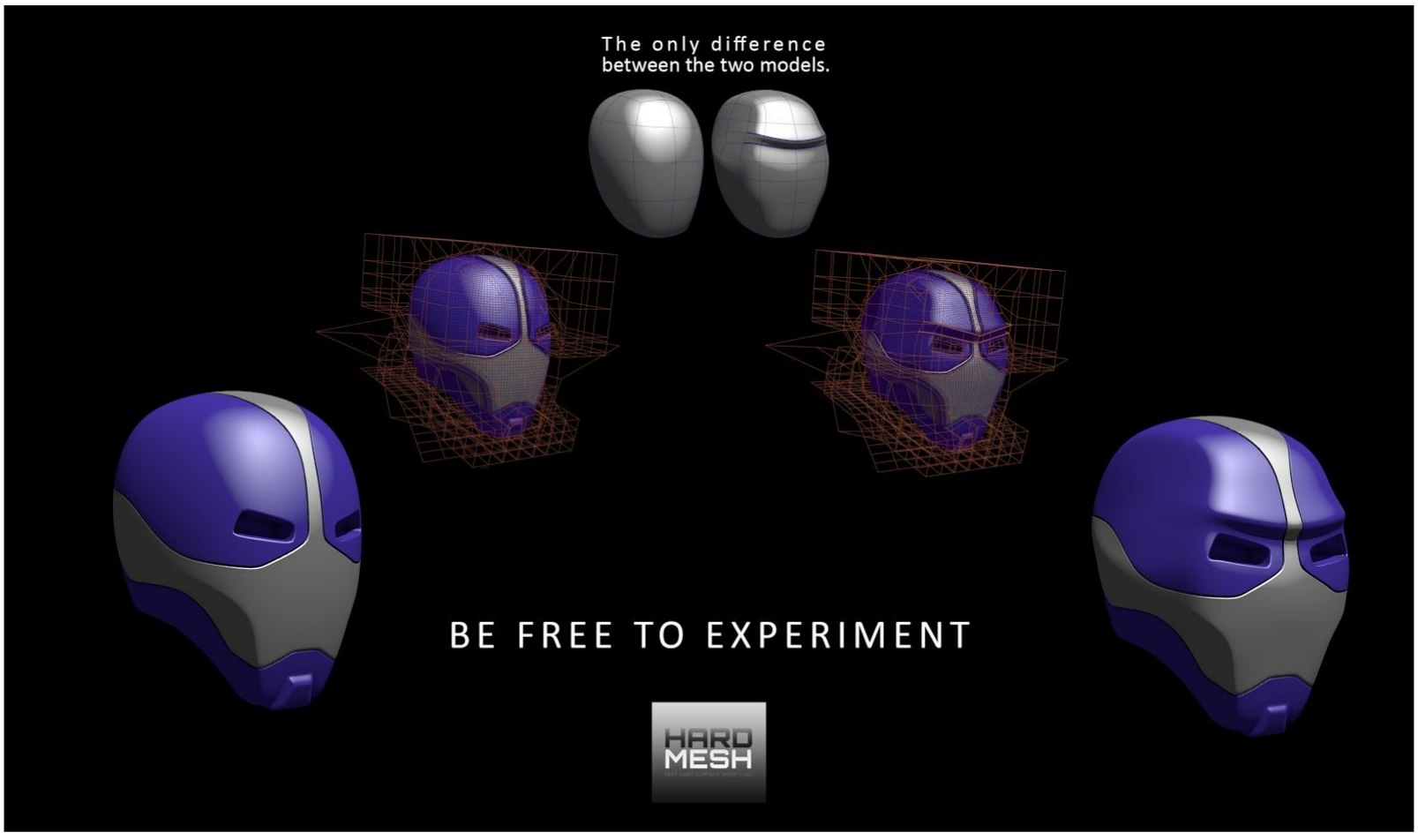
Introduction

Hard Mesh is a modelling tool for **Autodesk® Maya®** focused on speeding up and giving new workflows, especially in hard surface modelling.
The concept behind it is simple: Model **simple topology** and **fast editable** meshes and add details, blendings and cuts by combining the original models to obtain complex ones.



This helmet model is composed from different simple meshes, as you can see from the wireframe on the right.

With the introduction of version 2, a new workflow has been introduced allowing the user to use an interactive approach to the HardMesh operations.
The new workflow is builds upon the compound node and with the new dock UI window, it allows the user to create multiple operations in sequence handled in an efficient way.

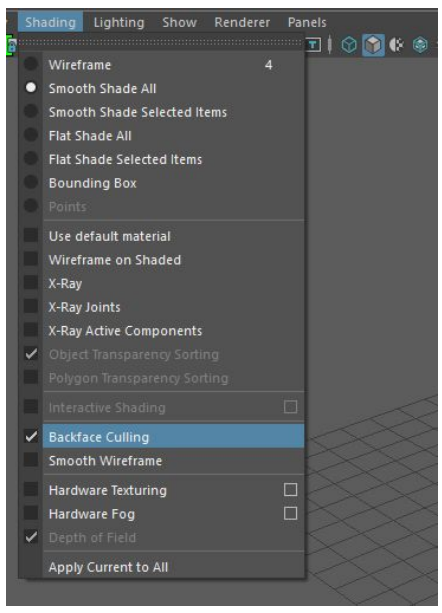


With the introduction of the interactive nodal workflow you are free to experiment and change the input of your mesh networks easily.

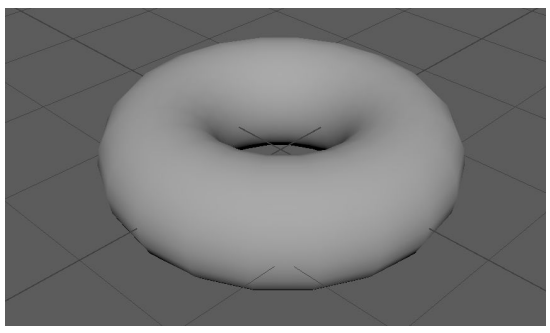
Modeling Guidelines

For having the best possible experience while using Hard Mesh, keep in mind these points.

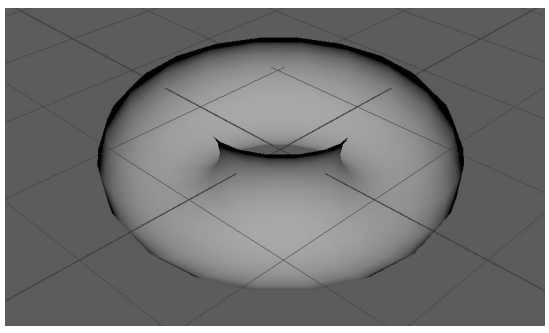
- **Geometries normals should face out:**
  In order to avoid unexpected results, the normals of the meshes should point always outside. Inverted normals will always give unexpected behaviors.
  An easy way for checking it is to activate the cackface culling mode on your current view pane.



Activate Backface Culling.



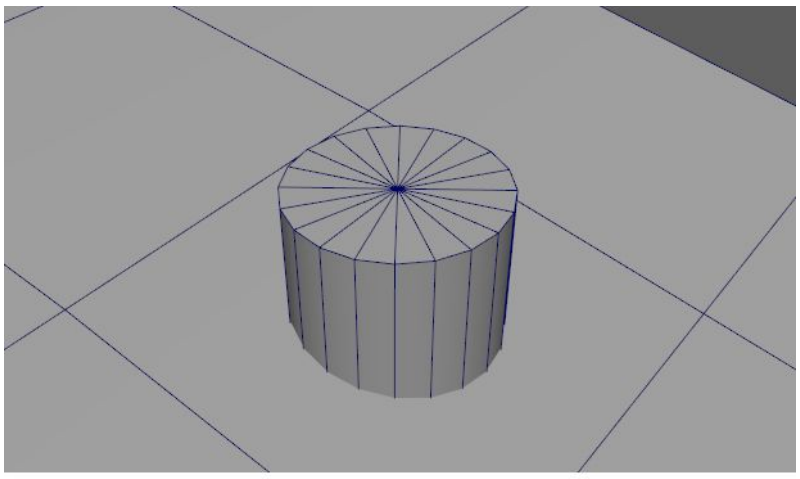
Normals in the right direction with backface culling on

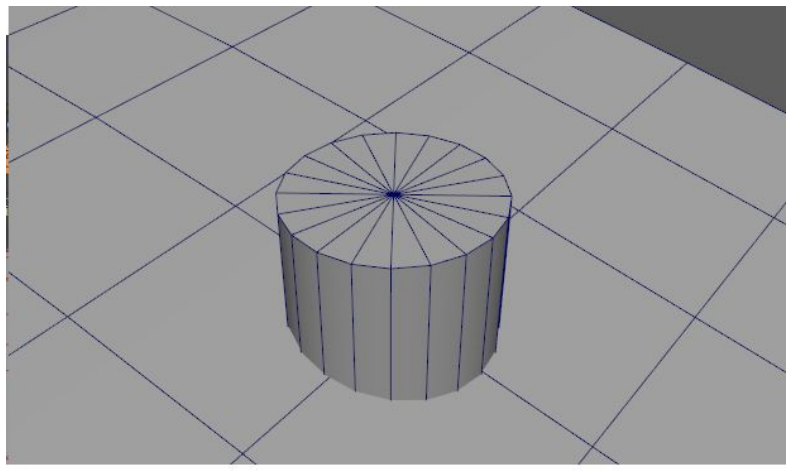


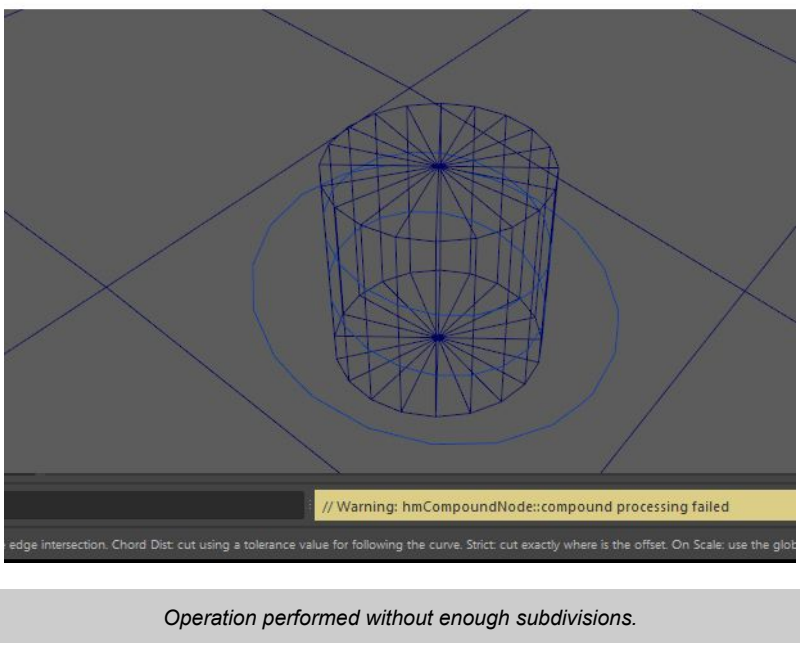
Normals in the wrong direction with backface culling on

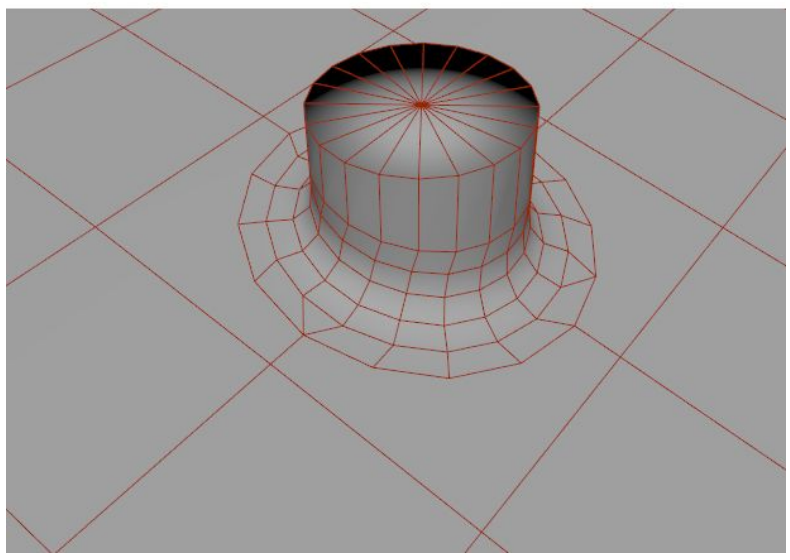
- **Geometries should be clean:**
  Even if we can work with almost any face shape (quads, triangles, ngons without crazy edge number..) the mesh that you give to Hard Mesh should be clean.
  This means, welded vertices if they share the same space, no nonmanifolds, and all the things that a modeler should check while modeling.

- **No Holes on faces:**
  Don’t try to perform operations that will end up with a hole on a single face, they will not work.
  Low density geometries are supported, but medium to high mesh densities are usually better.









Operation performed without enough subdivisions.

By just adding one subdivision on the plane the operation is succesfully performed.

- **Use the visual feedback of the curves:**
  The curve layer is great for debugging what could be wrong in your operation. If you see a weird curve it will give probably unsolvable results.
  Sometimes happens that the intersection will give opened curves. Or the angle between the two geometries is too small.
  When this happens, delete your last operation, put your geometries in a better position and recreate the operation.

- **Scale of scene matters:**
  If you work with large scale objects the algorithms will not work. This is a known issue that will be removed in next releases.
  We suggest you to work in centimeters with objects no larger than 100 centimeters.

- **No dynamic intersections count:**
  When you setup 2 meshes for an operation, you can change the shape unless you don’t create new intersections. If you start with 2 intersections you can’t end with 3 intersections, the new one will be ignored.

Hard Mesh Workflows

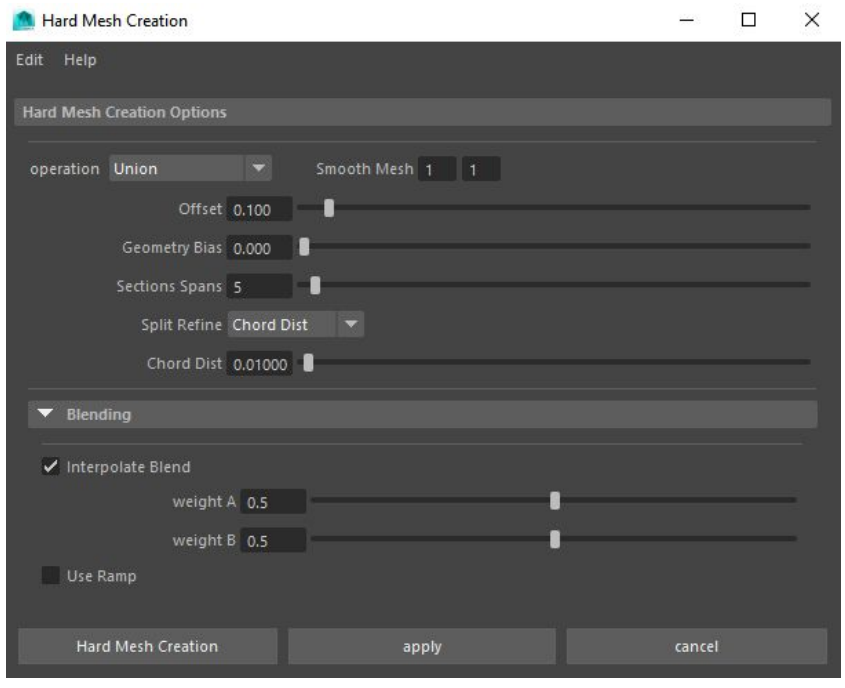
Depending on your needs, HardMesh can be used in many different ways in your production workflow. Let’s take a look at how we can use the power of HardMesh in different situations.

Concept modelling

You can use HardMesh for creating concepts for your 3d model, while keeping everything in history you are always able to edit and change the shape of your model for experimenting with all the freedom you need.

Key Options:

Geometry Bias is set to **0** and **Split Refine** is set to **Chord Dist**. **Smooth Mesh** is Low since we want to keep the interaction fast. Super low-res geometries (like a cube without subdivisions) should be avoided though.



Suggested Options for concept are the default options.

Topology Modelling Tool

If you already know what you want to model you can use the HardMesh tools for helping you with the creation of the right topology for your model. By using a HardMesh operation as a starting point, you will save a lot of time by just fixing the edge flow where you need it.

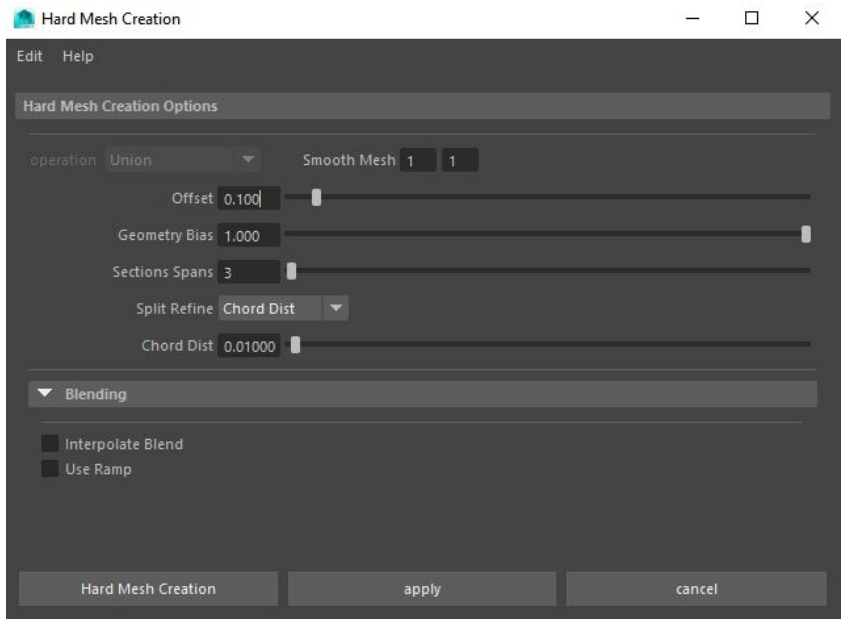
Key Options:

Geometry Bias is set around **1** and **Split Refine** is set to **Off** and **Chord Dist** is around **1 as well**.

By setting the geometry Bias to 1, the vertices on the geometry are snapped on the Offset curve before cutting and no extra geometry will be added from the split refine. By setting the Chord Dist with high values no extra geometry will be added on the blending region.

In this way we have the less possible geometry as a starting point for creating the edge flows that we need. Keeping the **Sections Spans** to **3** will also avoid to have too many details on the blending, assuming that all of the model will be subdivided in the end.

We also left **Off** the **Interpolate Blend**, in this way you will have a more squared blend, ideal for modelling operations.



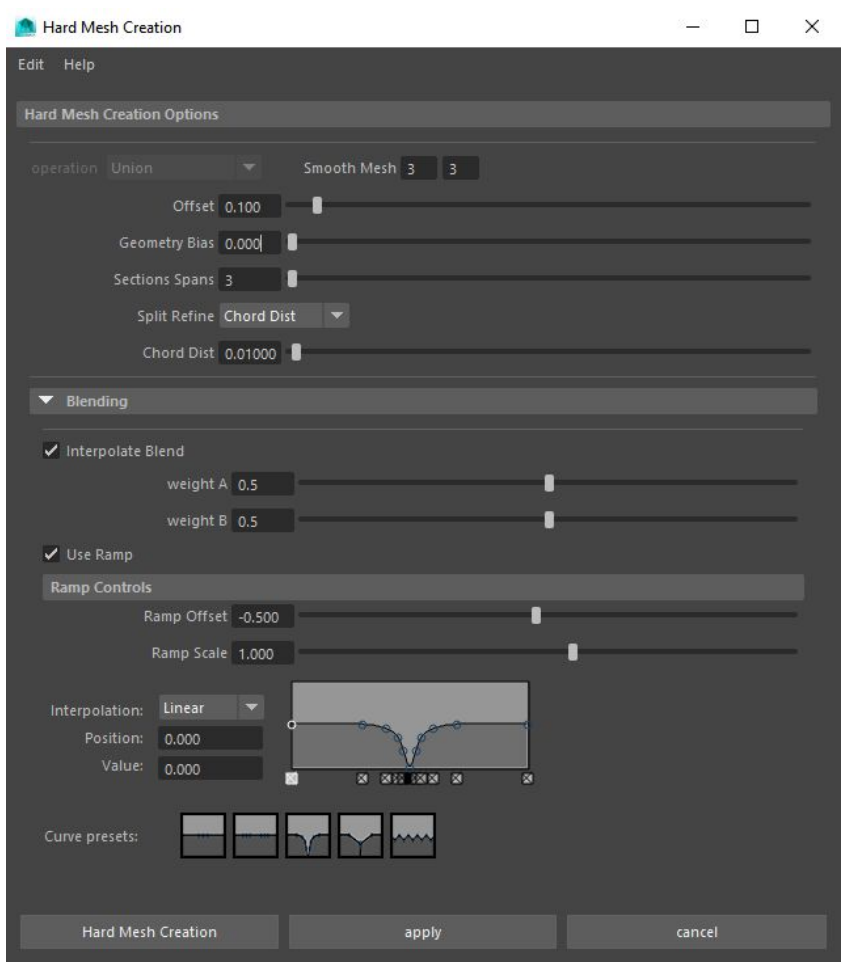
Suggested Options for using it as modelling tool

Details Enhancer

In some cases creating some Hard-Surface details by topology can be a nightmare and extremely time consuming. In these cases you can use HardMesh for adding that extra detail that will make the difference on your 3d model, without having to deal with super complex topology.
Use higher quality subdivisions and go ahead with your detailing!

Key Options:

Geometry Bias is set to **0** and **Split Refine** is set to **Chord Dist**. The **Chord Dist parameter** has low values for preserving the curvature of the splitting. **Smooth Mesh** is High since we want to use the output model as it is. In the example below we are also using the ramp feature that gives us the control over the profile of the Blend.

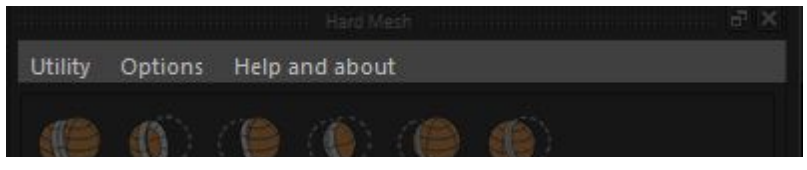


Suggested Options for using it as modelling tool and ramp

Workflow UI

The **HardMesh dock UI** is the core of the workflow providing a faster and easier way for creating and editing one or more nodes. From here you have access to the main commands and a faster way for editing parameters; plus some useful options and utilities for making the workflow and the user experience as easy as possible.

Utility and Options



The menu bar of the dock UI

Utility

Delete Input Meshes:

Option for deleting or not the input meshes while using one of the Clean Features.

Clean Selected:

Delete all the related hm nodes from selected.

Clean Scene:

When you are done with the HardMesh modeling this will clean the scene from unnecessary nodes by deleting all the related hm nodes and layers.

Remove Last Operator:

Clean delete the last operation added. You need a result mesh selected.

Options

Switch Mesh to Operator:

When this option is on, changing the hmCompound node under the optionMenu “operators” will change the visibility of the output mesh allowing the user to clearly see on which of the resulting meshes the current operations is working on. It works only when you have selected an output mesh, for activating the selection of an output mesh just hide the base meshes from the provided checkbox “base mesh.”

Wire Source Meshes:

This option turns on and off the forced wireframe for the input meshes, you may want to use this for changing the input mesh shapes with a better visual feedback.

Use Preferred Shader:

Leave this on if you want HardMesh to assign a better “default shader” than the lambert to the result meshes. It’s ideal for seeing the model features clearly and better tweaking the parameters.

Help and about

Help on HardMesh:

Open the online documentation for the current HardMesh version.

About Pux3d:

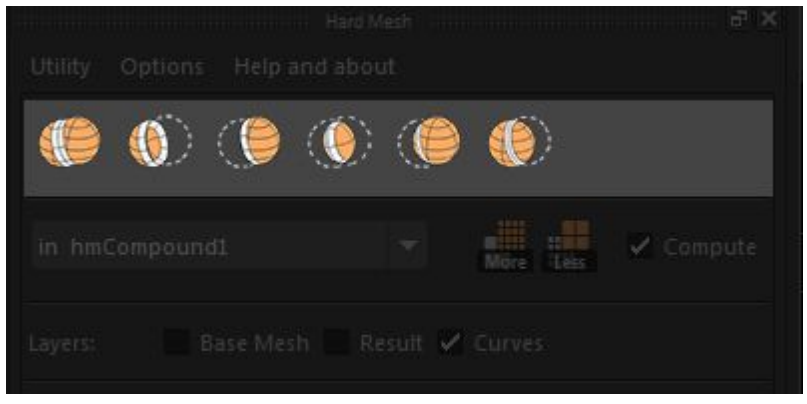
Open our website.

Version Info:

Get info on the current HardMesh version.

Creation Section

The creation part of the interface is represented by a set of icons allowing you to quickly perform the desired operation. Selecting 2 meshes you can perform: Union, difference, intersection and panel switching the effect between the first selected, A, and the second selected, B.
For accessing the creation options, just **double click** on the icon for opening the **option window.**



The icons for quickly creating the different operations

Hard Mesh Operation:

Select two meshes and click on the icon to run the command. You will see the result of the provided input added in the scene. Three Maya layers appear in the scene: original mesh, output mesh and curves.

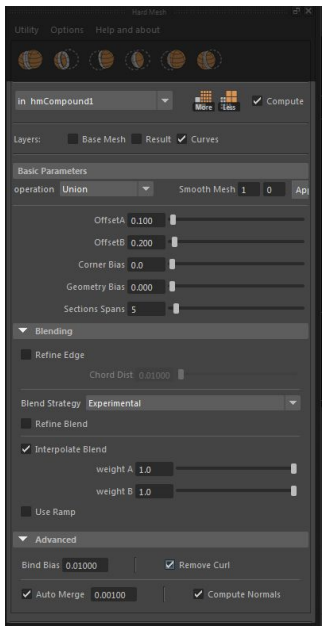
The order of the operations is:

-Union: merge the selected meshes.
-Difference A-B: subtract the second selected mesh from the first one.
-Difference B-A: subtract the first selected mesh from the second one.
-Intersection: create the output from the intersection.
-Panel A-B: use the intersection of the mesh A, first selected, for creating a panel on B, second selected.
-Panel B-A: use the intersection of the mesh B, second selected, for creating a panel on A, first selected.

You can of course change the operation performed any time during your modeling.

Editing

The editing section is the easier way for editing the networks of HardMesh nodes. There are many advantages over using the classic Maya + attribute editor workflow. The first is that just by selecting any of the meshes involved in any hard mesh operation with the **compound node**, the relevant attributes are immediately displayed, without having to search every time for the “right node” in the construction history of a mesh.



The editing section of the dock UI.

The edit panel also provides an efficient way for selecting/hiding the original meshes, output meshes and the curves with some easy to select buttons.
When your base meshes are visible, the selection for the output meshes is disabled for avoiding annoying unwanted selections of the output while editing the input.
By hiding the base meshes, the selection for the output meshes is possible again.

Layers section.

Increasing and decreasing the resolution of one, or more meshes here is easier with the two provided buttons, allowing the user to work with as low as possible resolution and finally increasing it when happy with the result. The compute button will disable the computation of all hmCompoundNodes.
When working with multiple cascades of operations it may be useful to “pause the computation” for modeling the input shapes better and reactivate it only when done saving a lot of slow tweaking.

And on top of all that, you can easily see what’s the effect of each individual compound with the convenient operators list located at the very top left of the UI.
Every time you change the operator in the list, the involved geometries change color for making the identification easier and the attribute list is updated accordingly allowing the edit.

Operation:
-Union: merge the selected meshes.
-Difference A-B: subtract the second selected mesh from the first one.
-Difference B-A: subtract the first selected mesh from the second one.
-Intersection: create the output from the intersection.
-Panel A-B: use the intersection of the mesh A, first selected, for creating a panel on B, second selected.
-Panel B-A: use the intersection of the mesh B, second selected, for creating a panel on A, first selected.

Smooth Mesh:

Smooth the input before the computation. This will allow you to keep the input mesh light and editable while computing the result on the Higher res version. If one of the meshes selected is the result of another operation, the smooth parameter will be ignored since the results of HardMesh are not meant for being smoothed after the computation.

Offset:

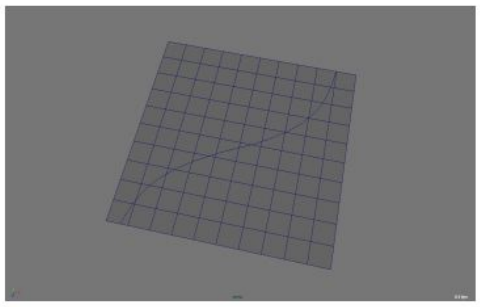
-How far from the intersection the cutting curves will be created. By clicking on the Split Sides button you will be able to set 2 different values for each side of the offset.

Sections Spans:

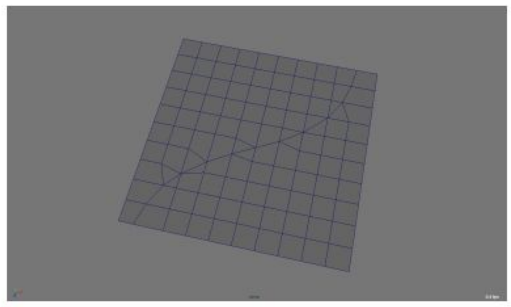
The value sets how many divisions will have the blending strips.

Geometry Bias:

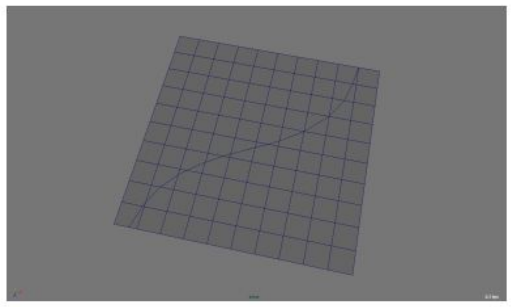
With value set to 0 we do a regular split, new edge loops on the curve will be created. With the value set to 1 we will get the nearest point and move towards the curve before cutting. With this method the insertion of new geometry is kept at the minimum.



Simple curve on a plane.



Geometry bias 1. The vertices are moved before cutting the mesh.



Geometry bias 0. The mesh is cut on every intersection adding more geometry.

Chord Dist:

This parameter sets a chord dist tolerance on the blending part of the model. Lower values will create a more accurate blending, with more geometry.

Split Refine:

The split refine will determine how the splitting on the offset curves will happen.

Interpolate Blend:

When on the profile will be rounded. When off the profile will maintain a corner in the middle, if the number of spans will be even.

Weight A/B:

How much the curvature of the mesh are considered in the blending.

Use Ramp:

Activate or the activate the ramp curve for controlling the profile of the blending.

Ramp Offset:

The offset of the ramp curve. Default is -0.5 allowing you to have the control of the profile both in positive and negative directions.

Ramp Scale:

How much of the points are shifted.

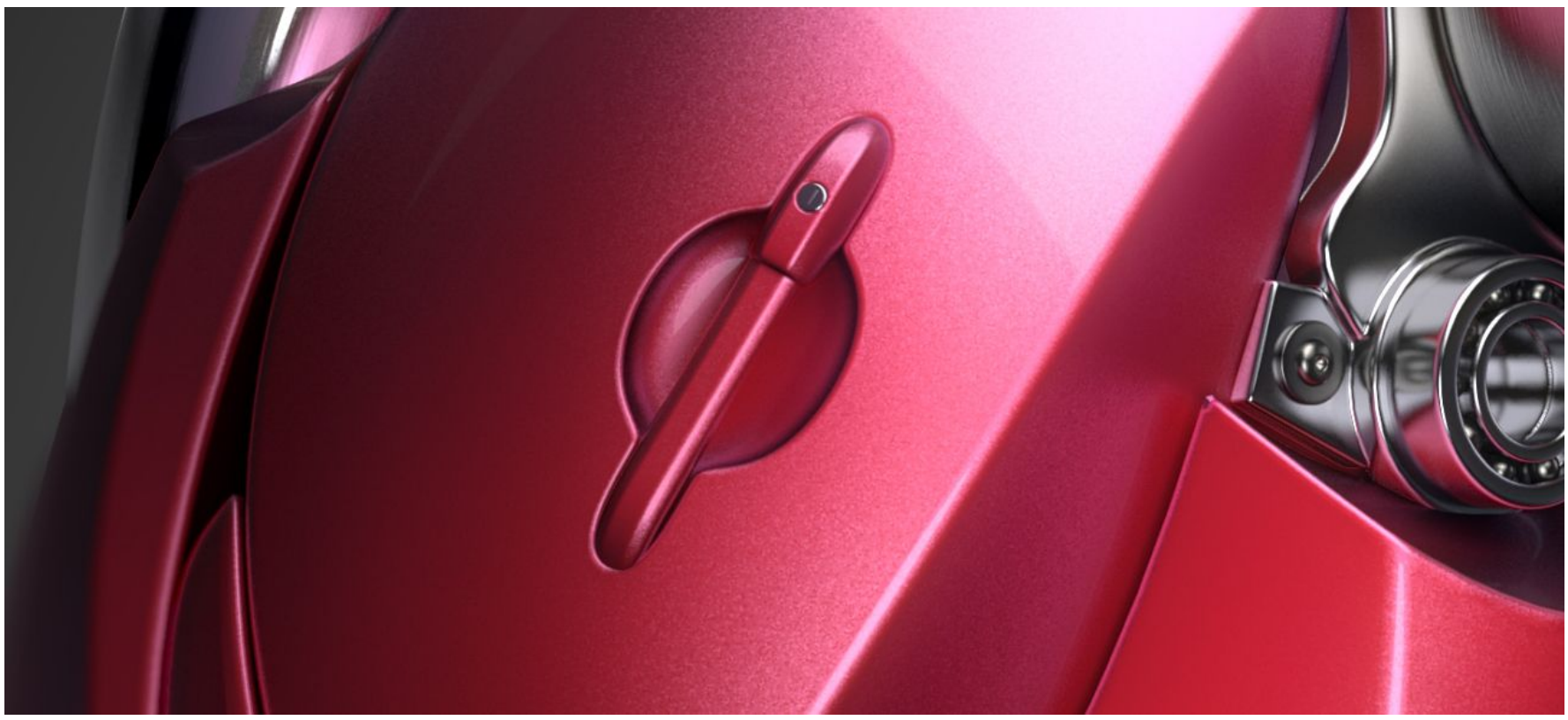
Case Studies

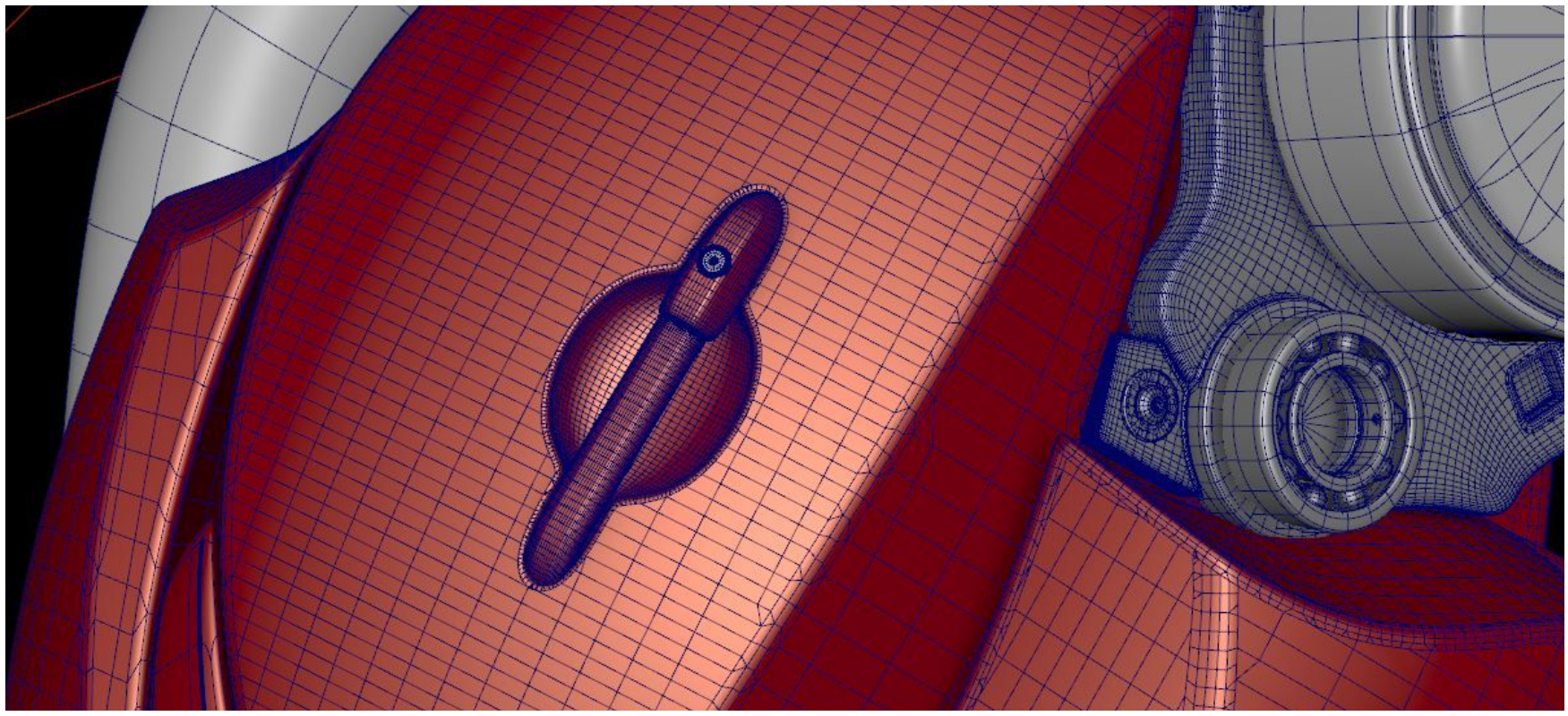
Mechanical Heart

For the creation of this advertising image the use of **HardMesh** helped a lot in the creation process giving the freedom of experimentation and refining of shapes in a procedural way. The elements that the client wanted in the pictures were pretty clear, but converting the idea in an actual 3d shape with the same mood required a lot of tweaking, while keeping the geometries looking like a car body.

The final advertising with the 3d visual

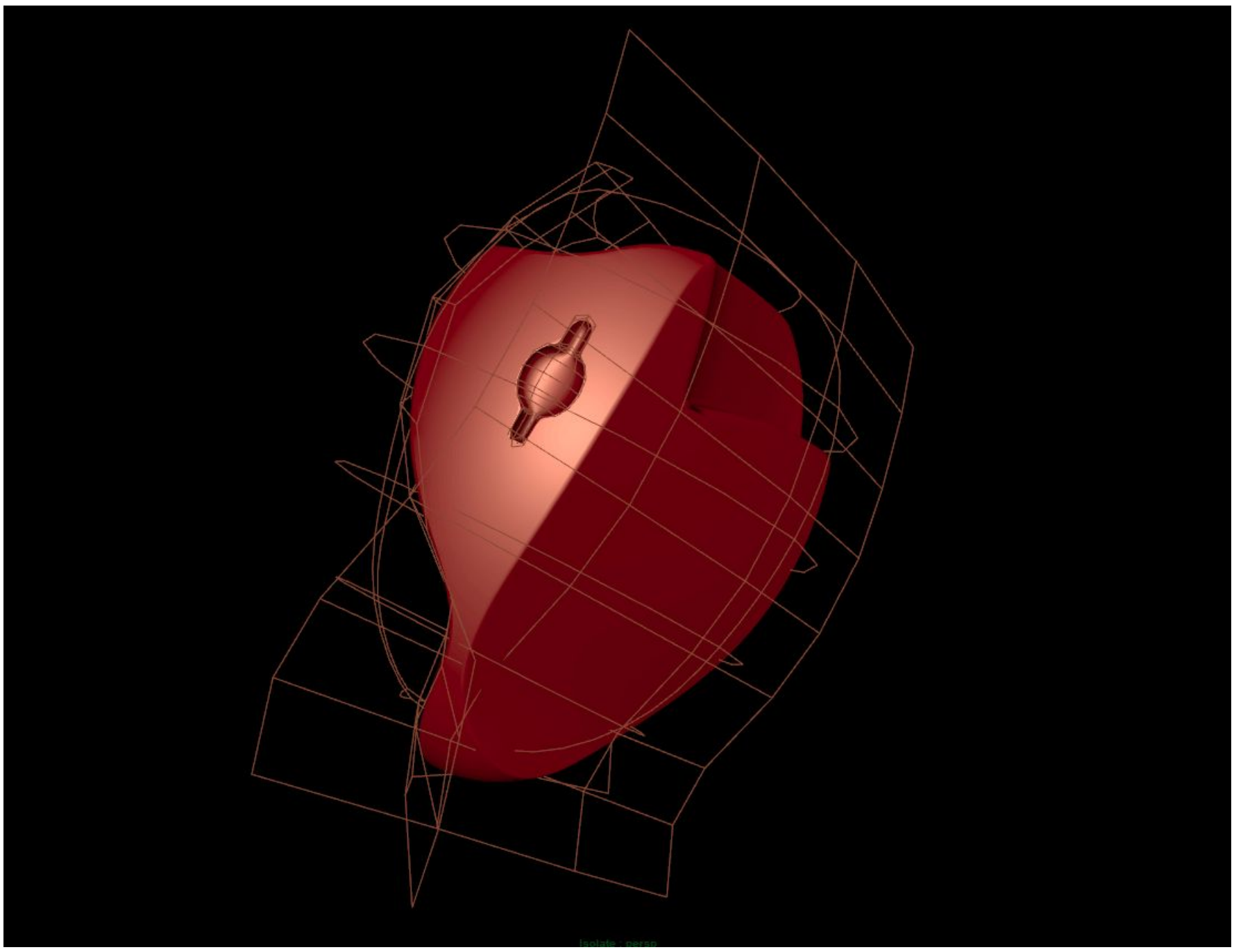
The ability to cut the meshes directly and handle the details only where needed decreased the modelling timing dramatically, especially since, as always, there were requested changes and different tests before having the final approval. For example this part, the handle, was an open point until the delivery.





The handle detail with the refine edge feature.

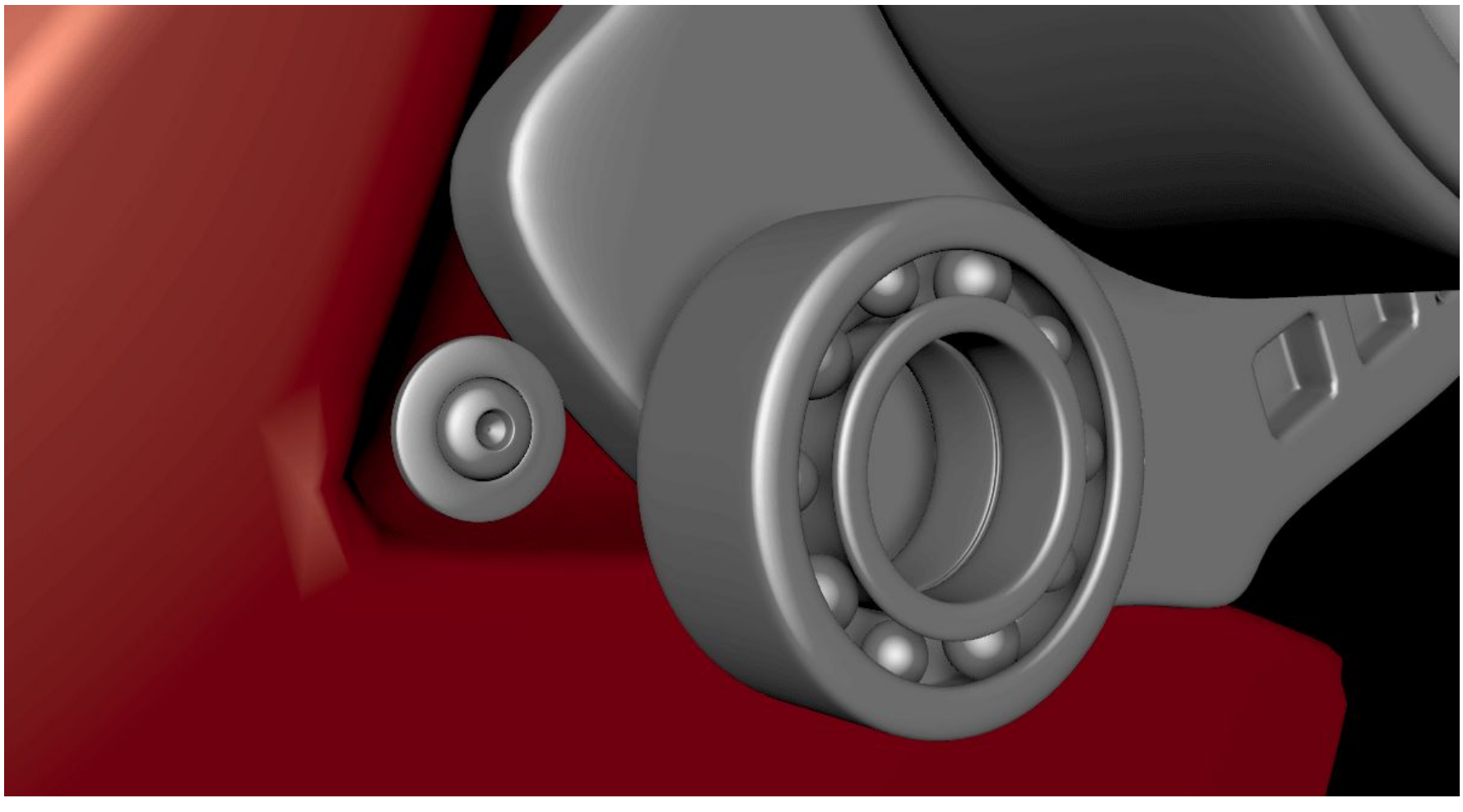
The ability to create the shapes with different intersecting planes was critical to cut the modelling times, with the guarantee of surface continuity.
When you have defined a topology you usually are constrained to it and even changing a small part can end up in lot of tweaks for keeping the nice and smooth look that design surfaces have. By keeping the modelling with different planes and surfaces the artist is more free to focus on the creative side without worrying about “destroying” the model with every change.



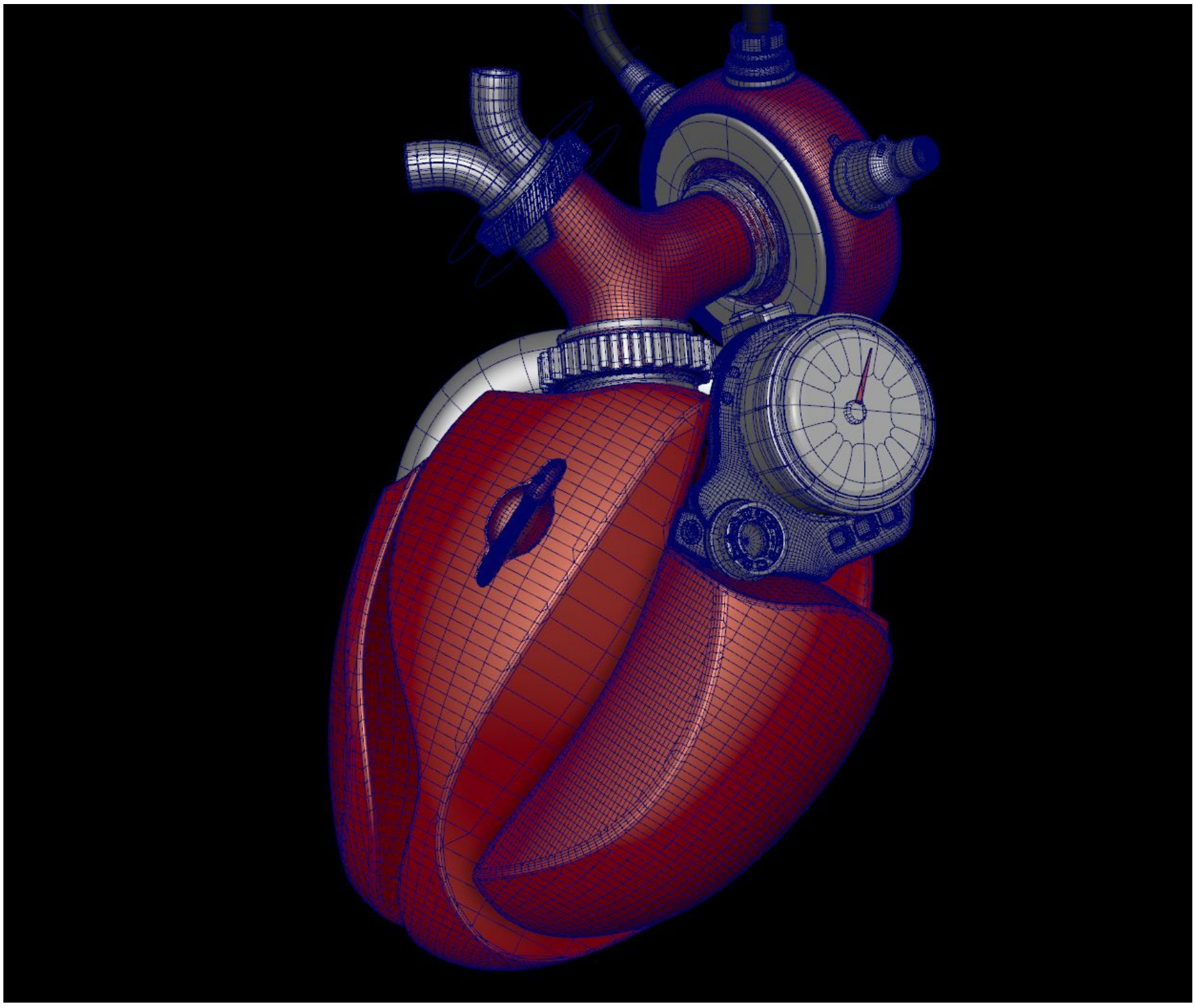
Some shape tweaking.

A closeup render shows the beauty of the shapes, no bumps or crooked curves, a nurbs like result.

When you have to create shapes welded together it is easy with some union operations. And with the ability to still tweak the inputs, creating hard surface models has become from long and tedious to fun and creative.



Combining shapes made easy.



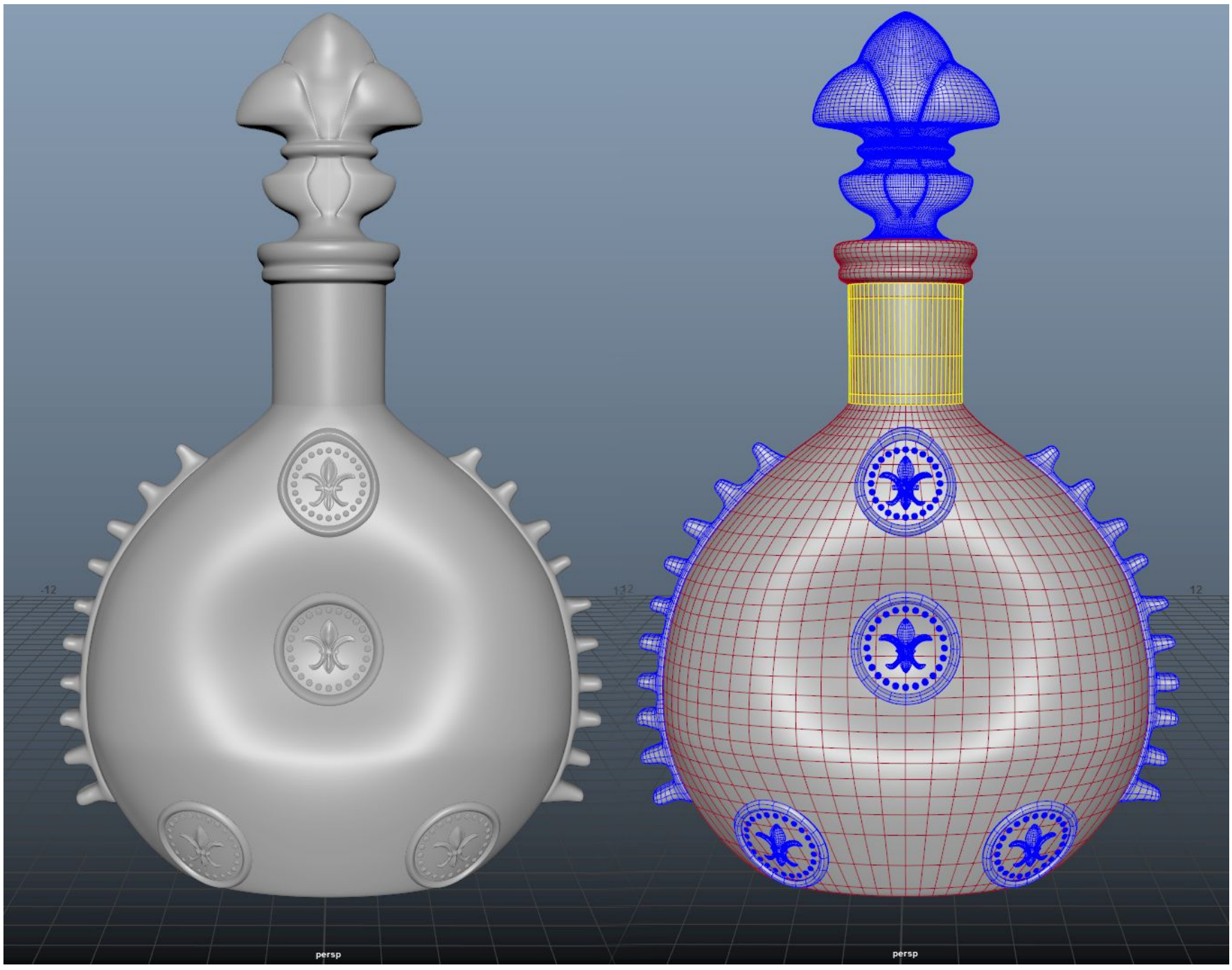
The 3d model wireframe reveal where HardMesh has been used

Cognac Bottle - An Overview On Modeling

One of our user is a very talented designer that uses Hard Mesh in his Maya workflow and sent me a beautiful render that was the starting point and inspiration for this work. You can see some of his amazing works here: http://www.msmd-studio.com/

For creating this render I created an optimized version of the bottle to be used with Hard Mesh.
In this overview we will see what is the best approach for combining and creating the shapes that compose this beautifil bottle as well as some tricks to keep in mind and reuse in your workflow.

The render and the wireframe of the final Hard Mesh model. Notice how all the details are blended togheter creating a unique mesh.

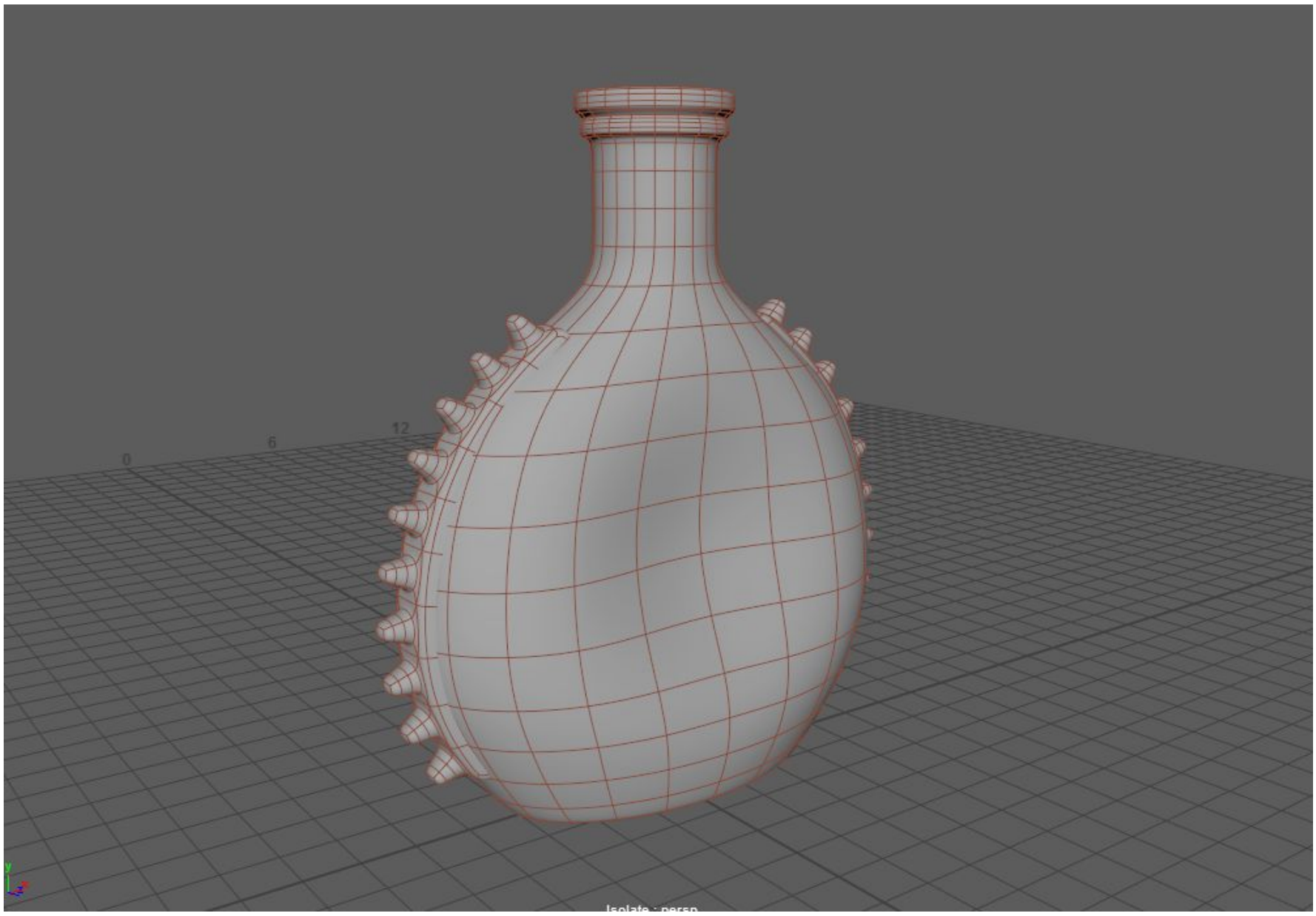


This mage shows the original model by Michael Sean Stolworthy. As you can imagine creating a unique piece of geometry without Hard Mesh it would be a tough task

The render by Michael Sean Stolworthy.

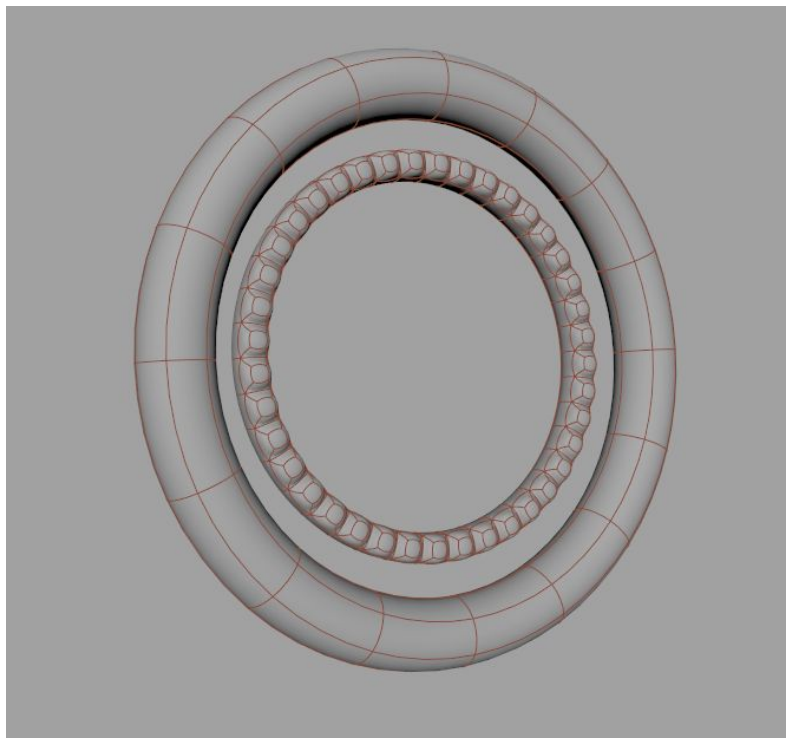
The Basic Shapes

The first step in order to get the most out of Hard Mesh is to create an optimized version of the model. We want that all the meshes intersect each other and than blend them. We could use the orignial meshes as well, but I wanted to create something for showing you what is a better approach if you already know that you will use HM.
Other that that, we will keep our initial polycount low and use the subdivision value inside the options to increase the resolution only in the end.
This will give us faster iterations and more levels of resolution to play with.



A lower res version of the main shapes.

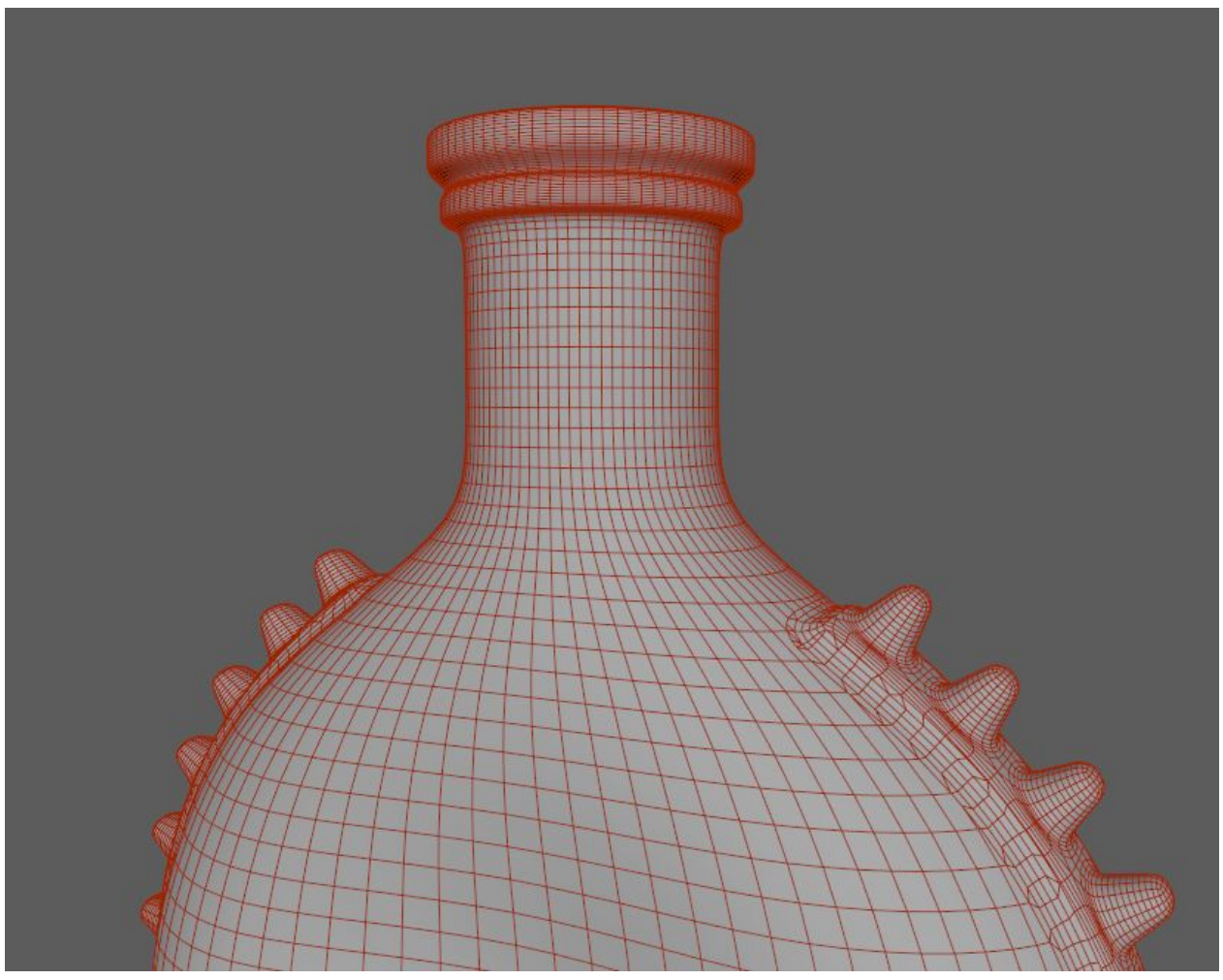
For creating the symbols on the main shape we will start from a torus, and for the inside dots, instead of creating multiple little spheres we can create a simple unique shape with some extrusions on top. By using this trick we will have faster computation and much more ease when we will need to adapt the symbol to the more curved part of the bottle.



The two esternal shapes of the symbol

Blending the Big Parts

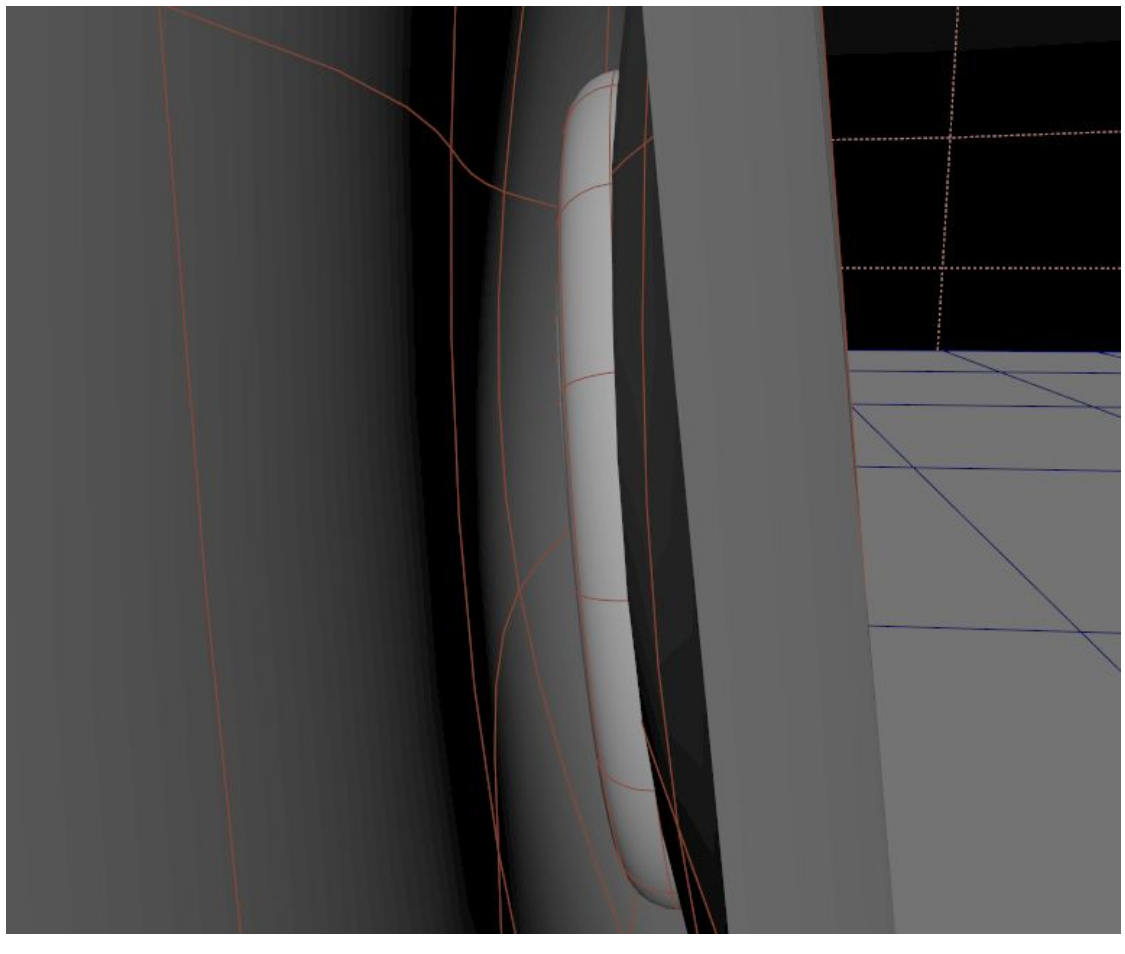
Blending the big side parts of the model is very easy since we have two large intersections that can be easily solved with the default options. And we don’t even need to use an high subdivision of the models, 1 level of smooth will be ok.



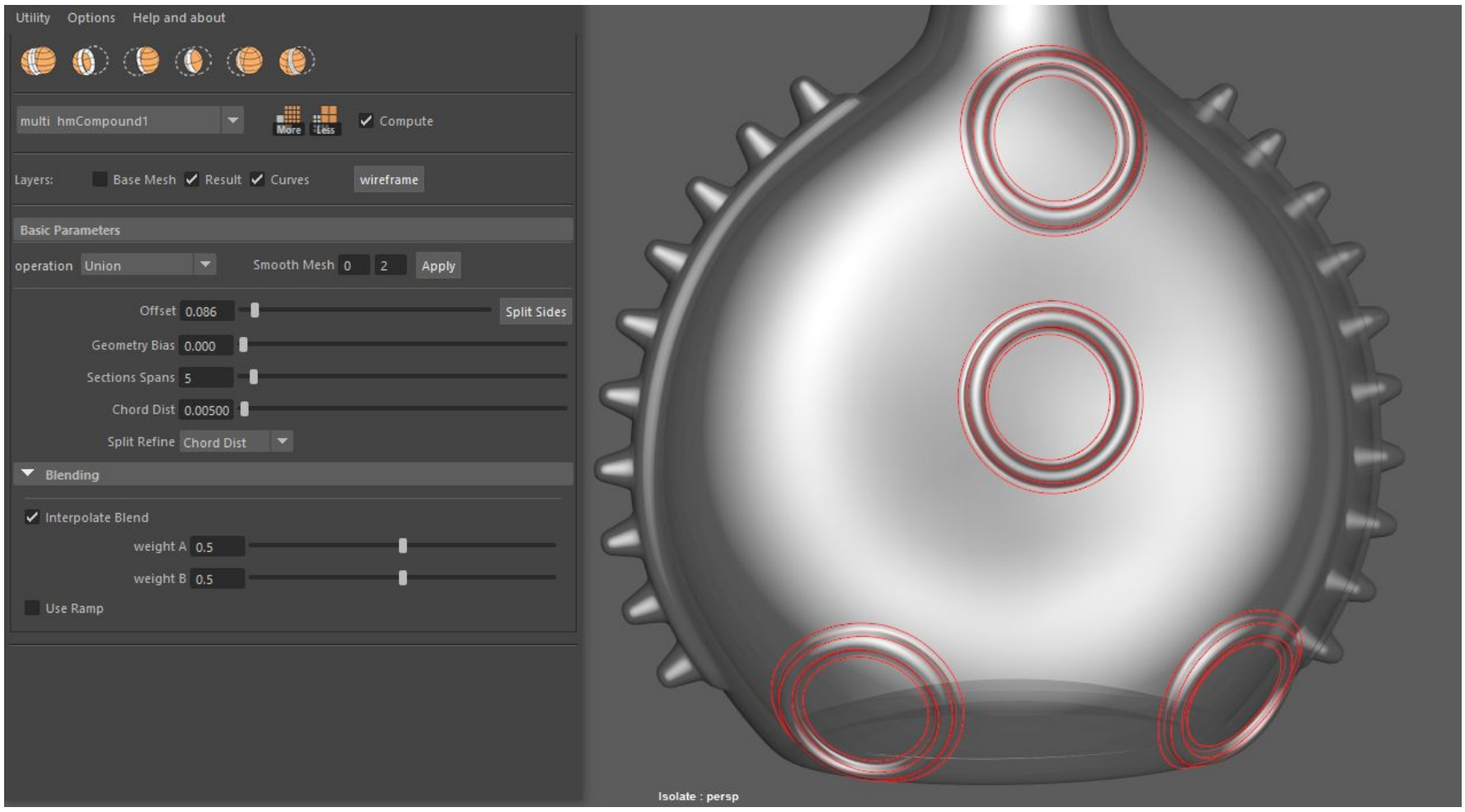
The bigger parts blended with the default options. Only the radius is bigger than the default one.

Blending the Small Parts

For blending the smaller parts we have to pay a little more attention for some reasons.
1) The **default radius** might be too big, and self intersecting offset curves wont give us solvable results
2) The bottle has a **thickness**, if one piece intersect both the inside and the outside of the bottle we will get unwanted results.
3) If we want to avoid the increasing of the base resolution of the base bottle, but keeping the **details of the symbols** we will need to lower the **chord ditsance**. This will cut more precisely before creating the blending geometry.



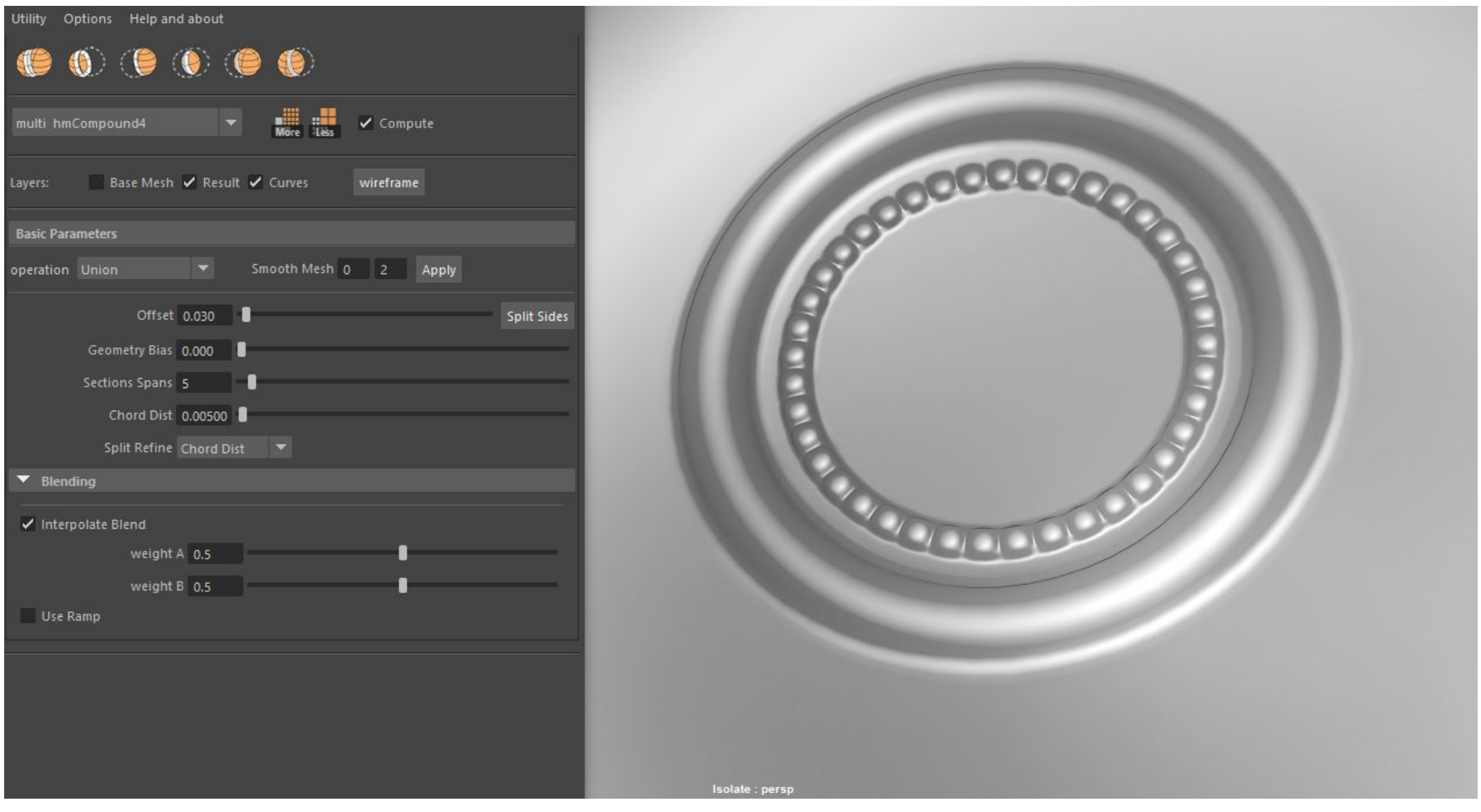
Notice the space between the outside and the inside part of the bottle and the torus that intersect only the exterior. This is important in order to avoid errors or unwanted results.



For the bigger toroids you can go ahead and blend them all toghether, no particular options except the radius needs special attention.

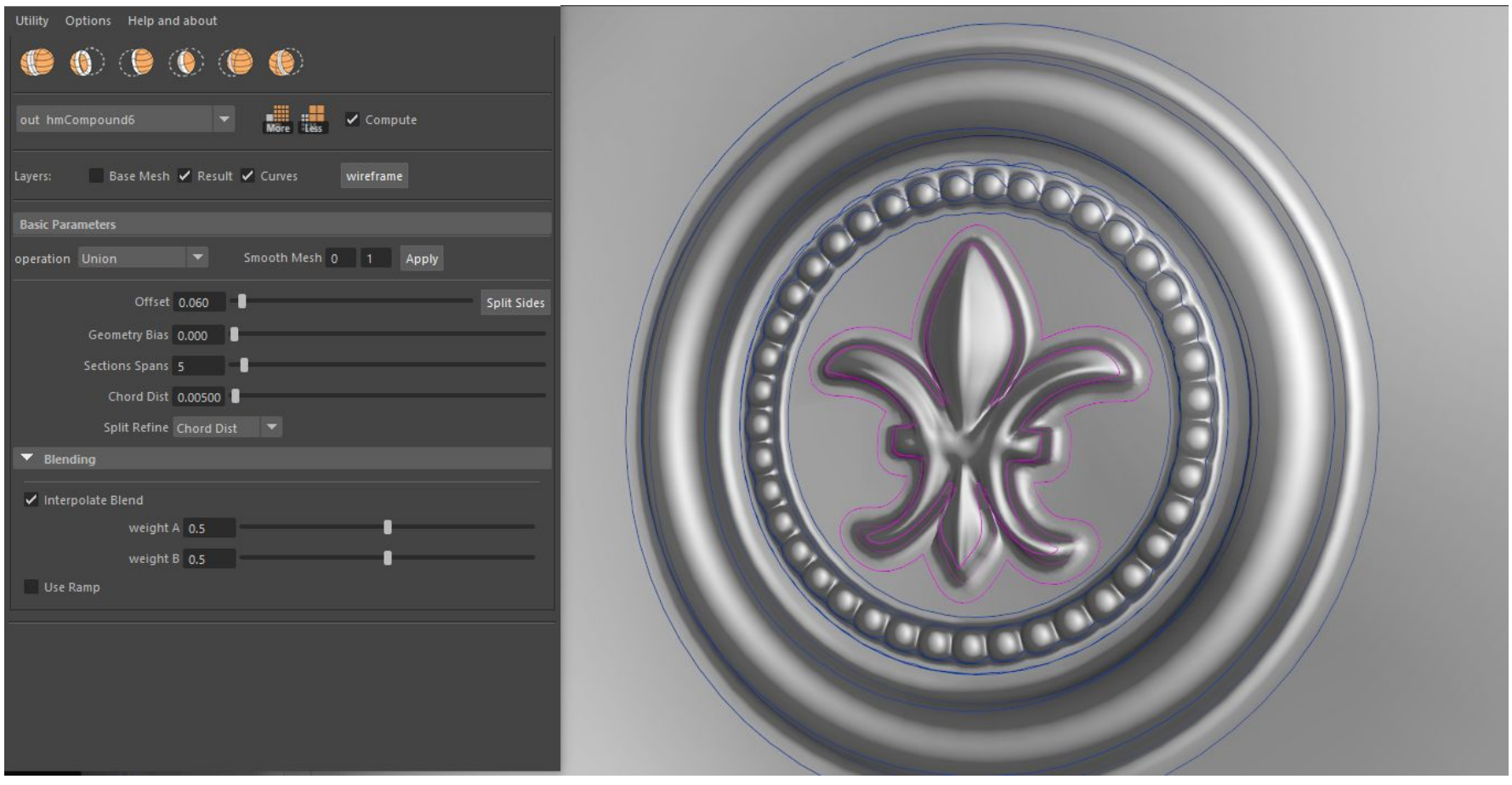
Try to solve each “dotted part” separately so you can concentrate on each case and:

- Perform the operation
- Adjust the shape and the values once you are happy
- Go and concentrate on the next one



The inner part and its options.

For the **leaf like** part we need some more attention also because the two offsets will end up being **quite different** and they could give hard times to the blending algorithm. Be patient and try to play a little until you will find the right values. Keep in mind that for avoiding to add too much geometry to the base bottle while obtaining a good result, you can increase the split resolution by **lowering the chord distance** parameter.

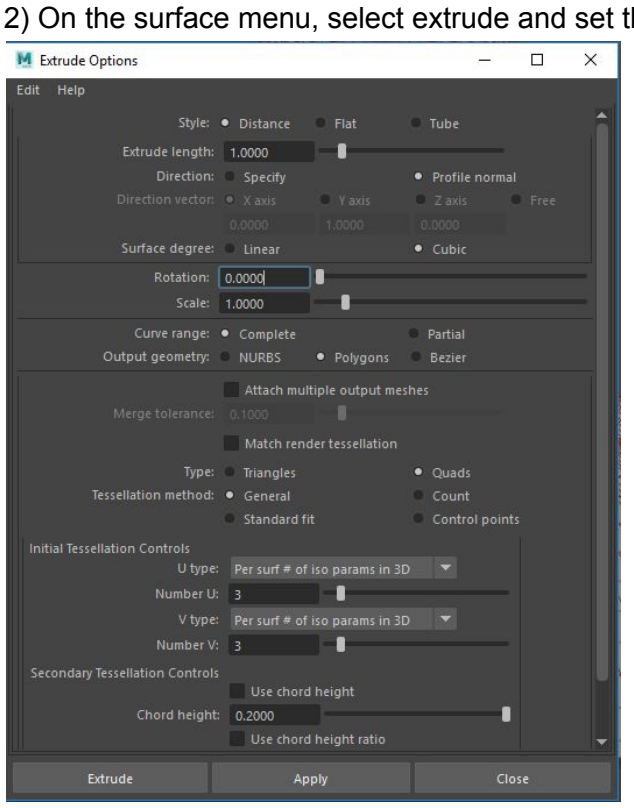


The inner part and its options.

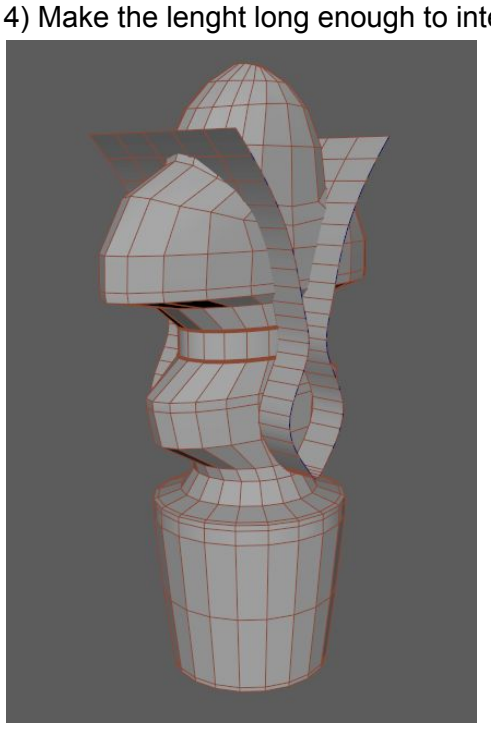
The Extruded Curve Tecnique

On the cap of the bottle there is only one thing that you might find useful to know.
Sometimes is very convenient to control the shape of an HM operation with a curve and in this little how to you will learn how.

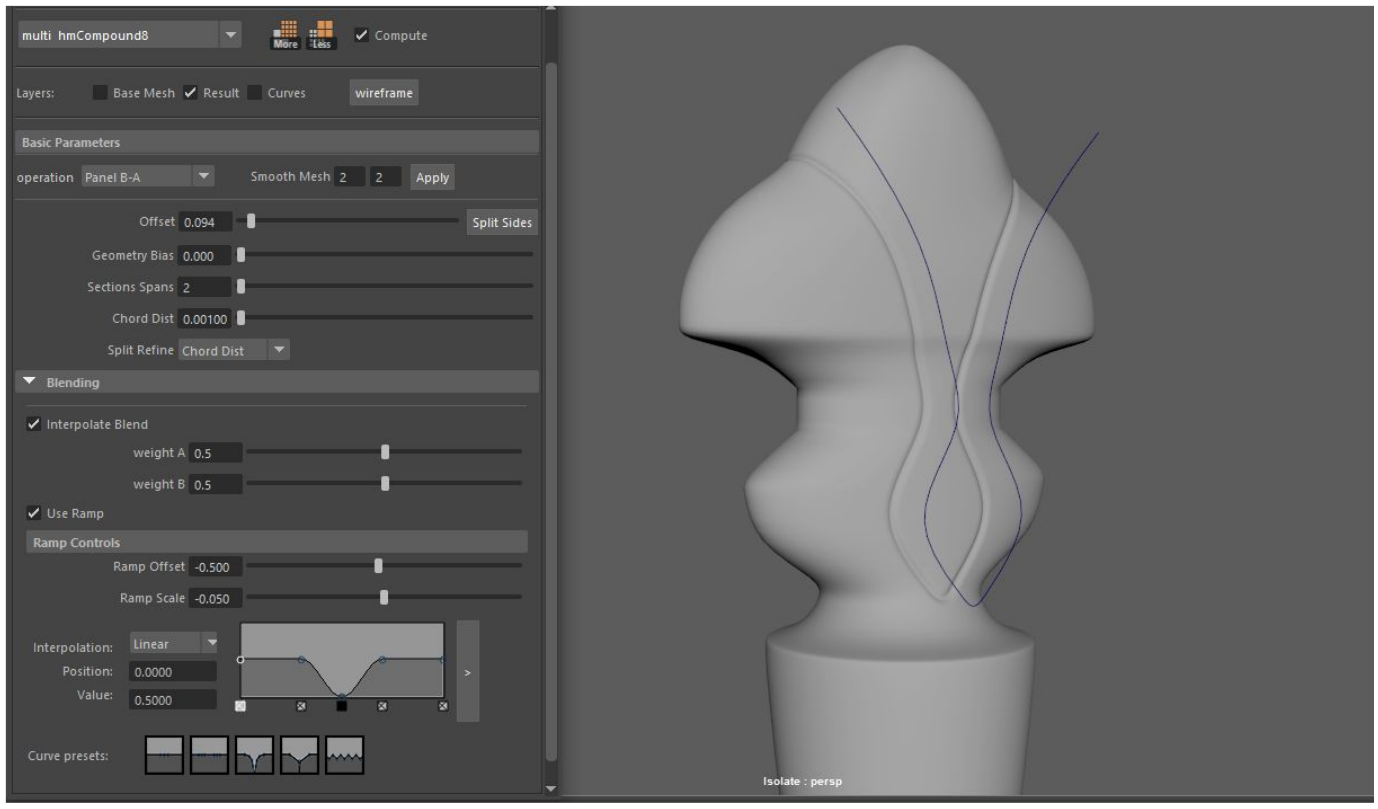
1) Create a curve with the shape that you would like to create the cut
2) On the surface menu, select extrude and set the options as shown and extrude.



3) You will obtain a poligonal extrusion of your curve, make sure to adjust the UV spans to make the mesh follow the shape of the curve.
4) Make the lenght long enough to intersect entirely the mesh that you want to cut, or better in this case to carve.



5) Now you can perform the HM operation.



And you are done, now by controlling the curve you will be able to define and edit your panel!
Remember that you can use this technique in many other cases and once you have a mesh from you extrusion you can perform any kind of operations, not only panel cut.

That’s it, we are done with the modeling! Ready for creating an awsome render of our work!

The whole bottle rendered, it was longer to render than to model.

FAQ

Installation

After the installation the plugin is not available on the plug-ins list.

If after installing HardMesh you can't find the plugin on your plugin manager there could be different reasons.

1) HardMesh is not on the common plugins list located in the Maya installation directory. Check on the other tabs that points to other directories

2) Maya can't read/find the module file:
    a) If for some reason your module file hasn't been written, you can check manually in your modules folder located under: *C:\Users\<user>\Documents\maya\<version>\modules*
    b) *If this folder is empty, you need to create a file called **hmTools.mod**, and inside write this content:*

    + PLATFORM:win64 hmTools any REPLACE WITH YOUR PATH
    PATH+:=bin
    c) *In the path part, paste the root location of HardMesh on your system. Save the file and open Maya.*

The plugin is on the plugin manager but it is not loading.

If you are trying to load Hard Mesh but you only have errors there might be 2 main reasons:
1) You still need to activate the license. Hard Mesh will not load without a valid license file
2) You have installed a version not matching with your maya version.

Licensing

When I try to activate the license I get an error:

If when activating the software you get this error the problem is caused from a missing Redistributable C++ library.

:Error: WindowsError: file C:\Program Files\Autodesk\Maya2016\bin\python27.zip\ctypes__init__.py line 365: 126 #

Download the Redistributable C++ library in your language directly from microsoft website here.

When I load the plugin I get a License not present error.

If you get the following error your license file hasn't been created.

// Hard Mesh: Licence not present //
// Hard Mesh: Invalid License or Trial licence is expired //
// Hard Mesh: Contact: info@pux-3d.com for information

Check that you have a file called "hmTools.lic" under the root of your plugin after activating the license as explained in the licensing instructions.

Common Errors

When I move the input meshes too much the result seems to be broken.

The current version is not supporting dynamic intersections. Majority of the time when you change the inputs too much, you create new intersection points that are not counted and can break the setup. When this happens:

- Select the result, broken mesh, remember to hide the input meshes from the UI for unlocking the result selection.
- Open the Hard Mesh window
- Click on Utility > Remove Last Operator
- Create a new Setup

If I increase the radius the blending part looks odd.

The radius value controls how far the offset curves are moved. Since the main purpose of the tool is to create blendings between meshes, if you are creating too large of offsets you are giving hard times to the algorithms that is not optimized to blend two totally different parts.

If you think that Hard Mesh should be able to solve your case, please send us (info@pux-3d.com) the scene so we can analyze it to make a better tool in future upgrades.

Workflow

Do I need Hard Mesh to open a model created with it?

Hard Mesh relies on custom nodes to let you create models with its own workflow. For being able to edit the model with the interactive workflow you need Hard Mesh on every computer that you want to use for editing the file.
However, when you finish your model, you can delete all the plugin nodes from the scene with just one click, with the command **Clean Scene** under the **Utility menu** of the **Hard Mesh window** and just deliver the final model.

Why is the resulting mesh not all quadrangular?

Hard Mesh has been created to speed up all the tedious tasks related with the hard surface modeling. Since majority of the time hard surface models don't need to be deformed, having a 100% quad mesh isn't necessary.
If for pipeline reasons you need a mesh generated only from quadrangular faces, we suggest to use Hard Mesh as a starting point for your topology and finalize your final model by hand.

Can I 3d print models generated with Hard Mesh?

As long as you follow the rules of your printer, the models generated from the plugin are totally compatible with a 3d printing workflow.