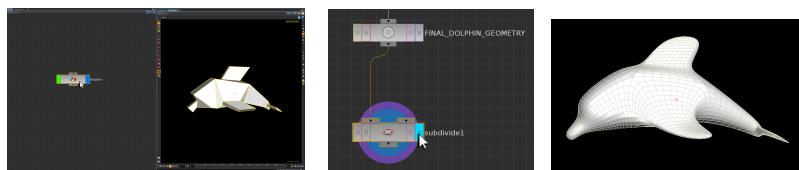


H14 DOLPHIN TEXTURING HOMEWORK

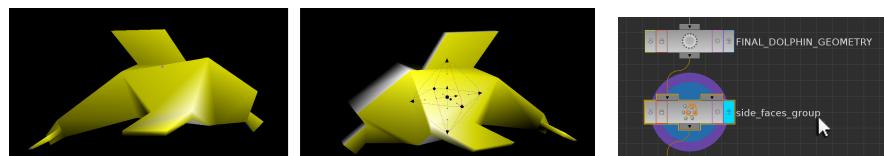
TEXTURING A DOLPHIN

Open the scene **dolphin_begin.hipnc**. This scene contains a **low polygon model** of a **dolphin** that can be used to demonstrate **UV unwrapping** of the geometry for **texturing purposes**.



At **Geometry Level**, a **Subdivide SOP** is also appended to the construction network to allow for a preview of the smoothed dolphin shape. When texturing it can be **simpler to texture a low polygon model** rather than a subdivided mesh, as faces of the geometry are easier to group and control.

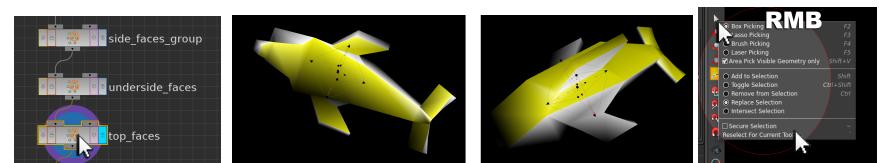
Reset the **Display and Render Flag** of the network back to the **FINAL_DOLPHIN_GEOMETRY Null SOP** and in the **Viewer** select all the faces for **both sides** of the dolphin.



In the **Viewer**, activate a **Group SOP** to group these faces together. **Rename** the resulting **Group SOP node** in the **Network Editor** to **side_faces**.

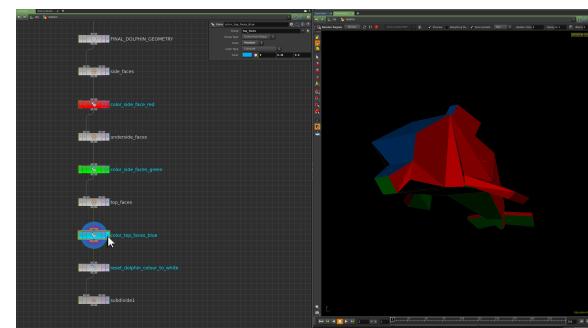
NOTE: This **node renaming** only gets **automatically** passed into the **Group Name parameter** if the expression `'opname(".")` is set in the **Group Name parameter**.

Repeat this operation, creating geometry groups for both the **underside** and **top faces**.



NOTE: **RMB** on the **Select Tool** of the **Viewer** will reveal **different selection options** including the ability to **reselect geometry** for the **current tool**. This can be useful if additional faces need to be added to a **Group SOP** or other operation.

Color SOPs can also be **inserted into the network** and **assigned to each group to verify** that **each face** of the **low mesh dolphin** has been **assigned to a group correctly**. This should be done by **specifying a Color SOP Class parameter of Primitive** rather than Point.



A **final Color SOP** with **white** assigned as its **Primitive Class**, can then be used to strip off this temporary colour.

See file **dolphin_stage1.hipnc**

H14 DOLPHIN TEXTURING HOMEWORK

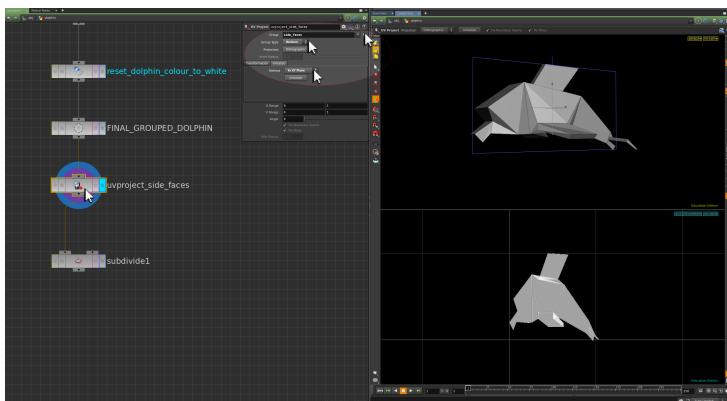
When all of the individual primitive face groups have been created, UV Projections can be assigned for each group. Insert a **UV Project SOP** above the final Subdivide SOP, specifying in its **parameters**:

Group	side_faces
Group Type	Vertices
Projection	Orthographic

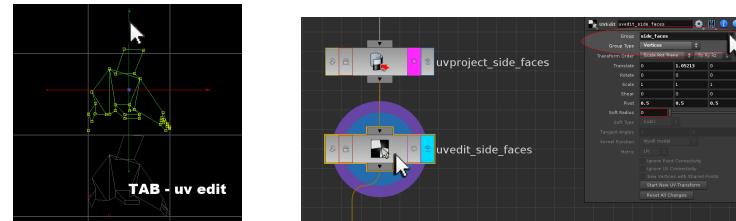
From the **Initialise** section of the **parameters** specify:

Method	To XY Plane
Initialize	

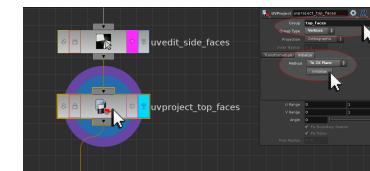
This will **project the sides** of the dolphin geometry into the **UV Texture Square** (which can be seen in the **Viewer**, by creating two stacked views, with the lower view set to **SPACEBAR + 5**).



In the **UV Texture Square**, activate a **UV Edit SOP**, and translate all the vertices of the side faces upwards so that they are outside of the main UV square.



The **side_faces group** can also be explicitly called in the **UV Edit parameters** to keep the network fully procedural.



In the **Network Editor**, append a **UV Project SOP** for the **top faces** of the **dolphin geometry**. In its parameters specify:

Group	top_faces
Group Type	Vertices
Projection	Orthographic

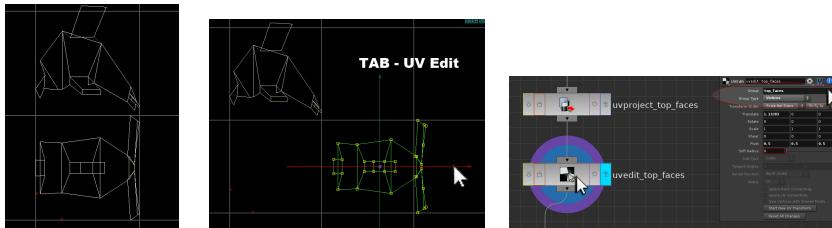
From the **Initialise** section of the **parameters** specify:

Method	To ZX Plane
Initialize	

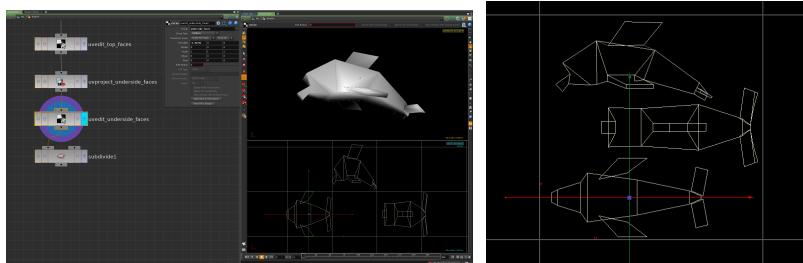
This will project the top faces into the main UV square.

H14 DOLPHIN TEXTURING HOMEWORK

As before, a **UV Edit SOP** can be used to move the **top_faces** projection outside of the main UV square. The **top_faces group** can also be explicitly called in the **UV Edit parameters** to keep the network fully procedural.



Repeat this **UV Projection/Edit** process once more for the **underside_faces** of the dolphin geometry. The **UV Edit SOPs** can now be **further edited** so that **all projections fit within the main UV square**; ensuring that the projections do not overlap.

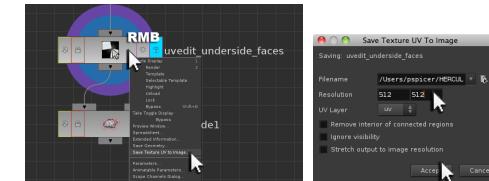


NOTE: Scaling the UV Edit SOPs to the same amount can help restore the overall proportions of the dolphin helping make the texturing process visually simpler.

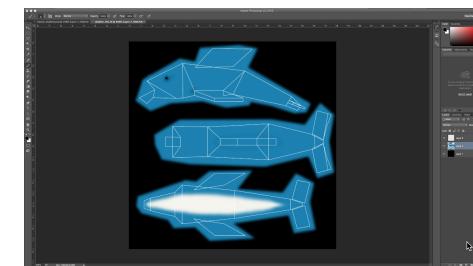
See file **dolphin_stage2.hipnc**

SAVING UV INFORMATION AS AN IMAGE

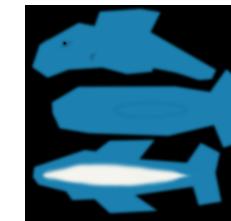
When the dolphin projections are all in the main UV square, this information can be saved out as an image. **RMB** on the final **UV Edit SOP** and from the resulting menu choose **Save Texture UV to Image...**



In the resulting dialog window, specify a **Filename location** and a **square resolution** for the **UV image**, and press the **Accept** button. This will save the image out as a file.



This UV information can then be used as guides in Paint Software (such as Photoshop or Gimp) to generate the texture map for the dolphin.

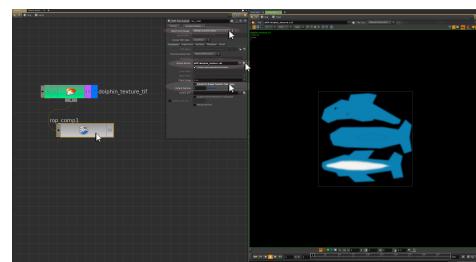


H14 DOLPHIN TEXTURING HOMEWORK

When the **texture map** has been **completed**, it can be **saved** and **then converted** into a **16 bit .rat file** (with gamma removed), so that it can be **reapplied to the dolphin geometry**.

This can be done at the **IMG Level** of Houdini (the Compositing Level), using a **File COP** to read in the **finished texture**, and a **ROP Output Driver** to **write out the image** to disk as a **.rat file**. In the **parameters** of the **File COP** specify:

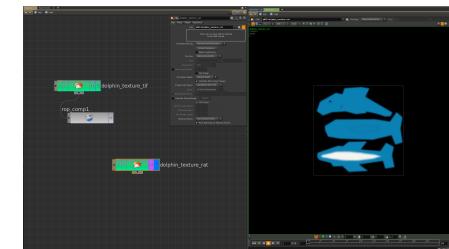
File Raster Depth	Specific Depth
Depth	16 Bit Floating Point



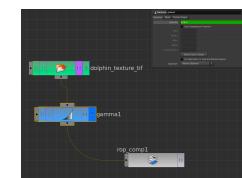
In the **parameters** of the **ROP Output Driver**, specify:

Valid Frame Range	Render Current Frame
Output Picture	\$HIP/my_dolphin_texture.rat
<input checked="" type="checkbox"/> Convert to Image Format's Color Space	
Output Gamma	1

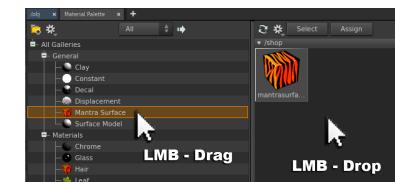
After the image is rendered to disk, use a **second File COP** to **check** the **.rat file** to ensure the **colour information looks correct** in the **Viewer**.



NOTE: If for any reason an **8 bit image** appears washed out in Houdini's compositor, a **Gamma COP** can be used to **remove the gamma** by specifying **1 / 2.2** in the **Gamma** parameter.



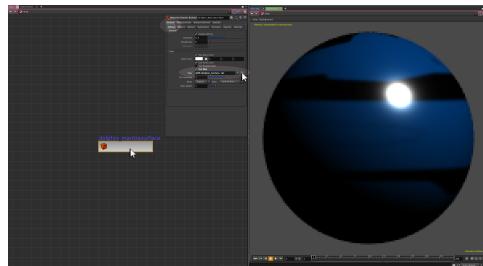
Activate the **Material Palette**, and **LMB Drag and Drop** a **Mantra Surface Material** into the palette region.



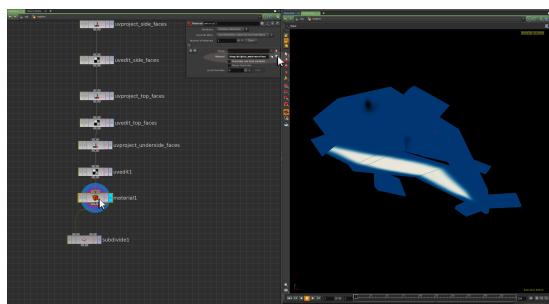
This **Material** can then be **modified** at the **SHOP Level** of Houdini to read in the **.rat file** texture map.

H14 DOLPHIN TEXTURING HOMEWORK

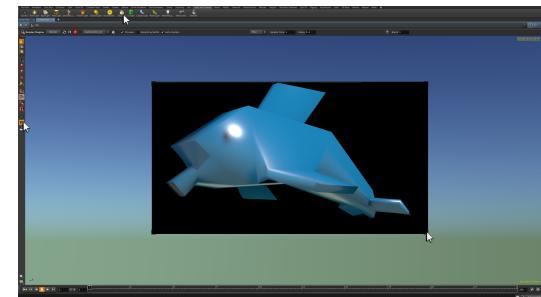
Under the **Surface > Diffuse > Color** section of the parameters, activate the **Use Map** option to read in the **.rat** file as the **Diffuse texture**.



The **Material** can then be assigned onto the dolphin geometry using a **Material SOP**. As UV's were created for the dolphin, the painted texture automatically aligns with the UV Projections and UV Edits done to the geometry.



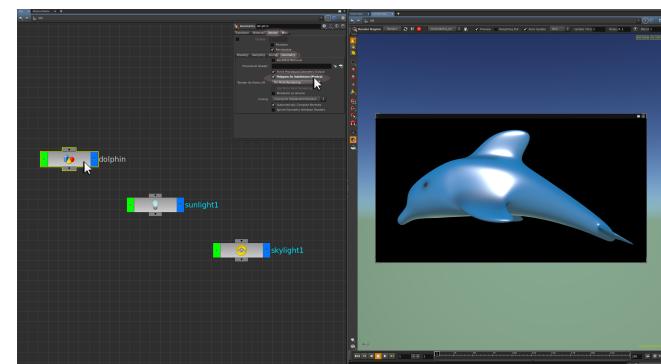
Back at **Object Level**, a **Sky Light** can be activated from the **Lights and Camera Shelf**, and a **Render Region Preview** drawn over the **Viewer** to see the result of the texturing work achieved.



SUBDIVIDING GEOMETRY AT OBJECT LEVEL

As well as the **Subdivide SOP** which can be used to smooth and refine low polygon geometry into higher-level topology; there is also an **Object Level option** to **convert the geometry to subdivisions at Render Time**. Sometimes this can be **advantageous** as it can **save computation time**, as well as allowing for networks to run with low polygon geometry.

This **Polygons as Subdivision (Mantra)** option can be found in the **Geometry Object's parameters**, located in the **Render > Geometry** section.



See file **dolphin_complete.hipnc**