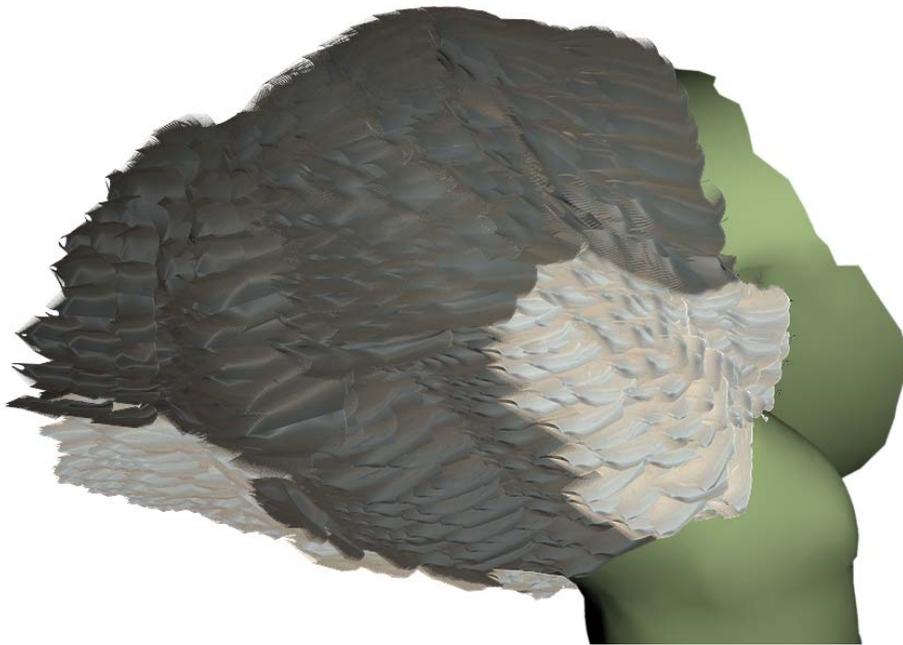


Start to Finish Feathers Solution (SFFS)



User Manual

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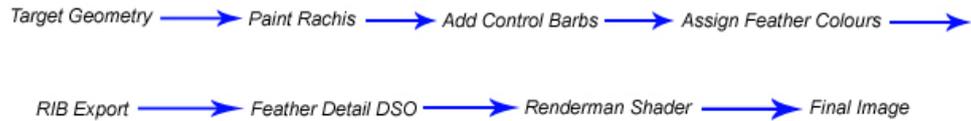
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1. Pipeline Diagram

Start to Finish Feathers Solution Pipeline



The SFFS has been designed to work with Maya 6 and PRman 12 both on Windows and Linux operating systems, but the plug-ins supplied have been compiled for Linux Red Hat 9.

The information given in this document is intended purely as a simple user reference guide and by no means gives in-depth detail into the inner workings of the pipeline and how it can be evolved. For more technical information about the pipeline, see the Masters Thesis, which comes with this project.

2. Setting up the Pipeline

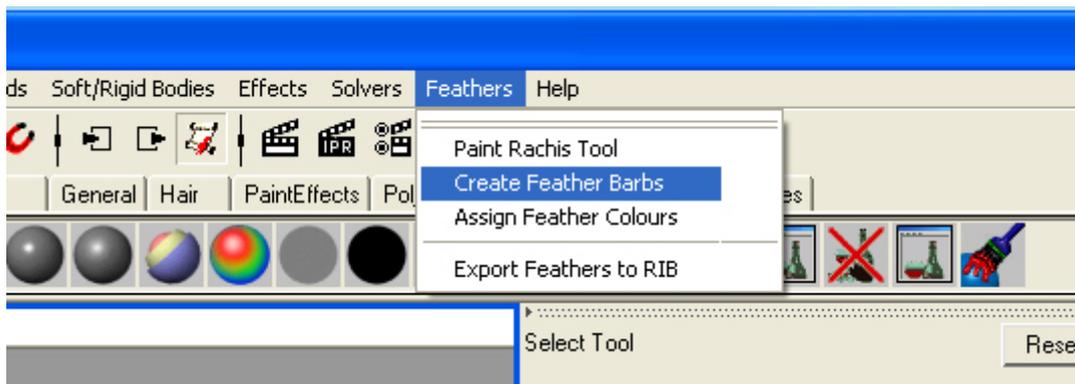
2.a Sourcing MEL Scripts

The tools in Maya designed for the SFFS are like all Maya tools, driven by MEL. In order to start using the Feathers tool, the MEL scripts must be sourced.

In order to reduce the time spent sourcing the MEL scripts it is best to place all the of MEL scripts in the installation directory of Maya under:

`/scripts/others/`

This will mean that every time Maya is loaded the Feather tool scripts will also be loaded, and the user will be able to use the Feather tool immediately via the Feathers menu on the Main Menu bar.

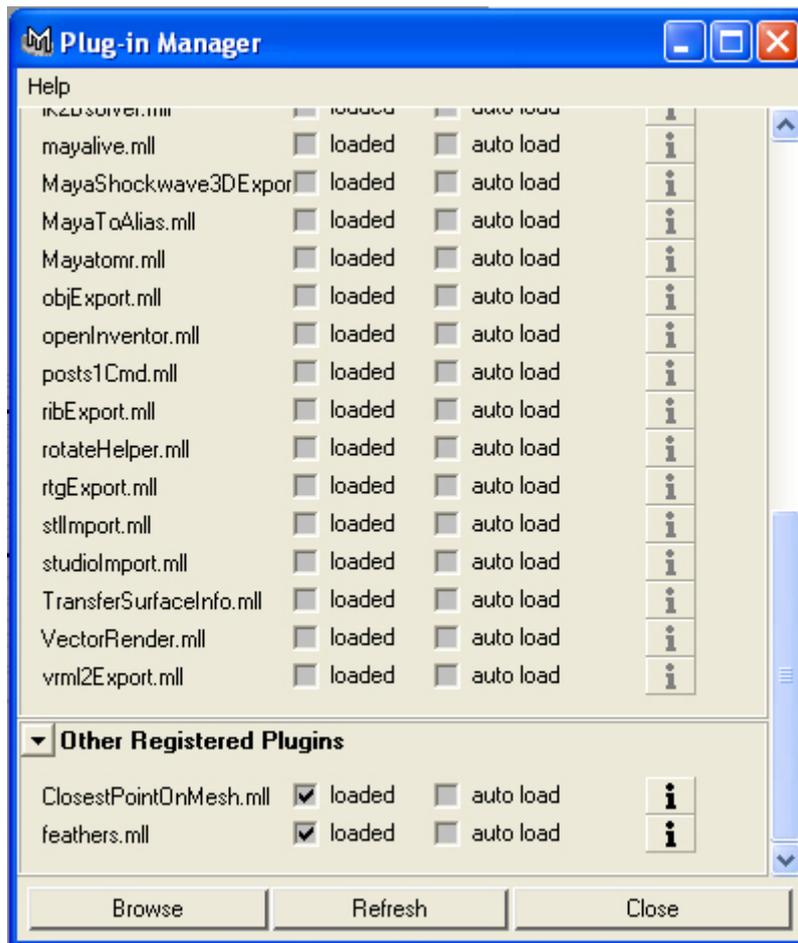


2.b Loading Maya Plug-ins

The Maya Plug-ins required for the Feathers tool can also be automatically loaded on start up, by placing them in the installation directory of Maya under:

`/bin/plugin-ins/`

If the user does not want these plug-ins to be loaded every time with Maya, then they can load them on demand by using the **Plug-in Manager** found under the Windows menu.



2.c Setting Location of Renderman DSO

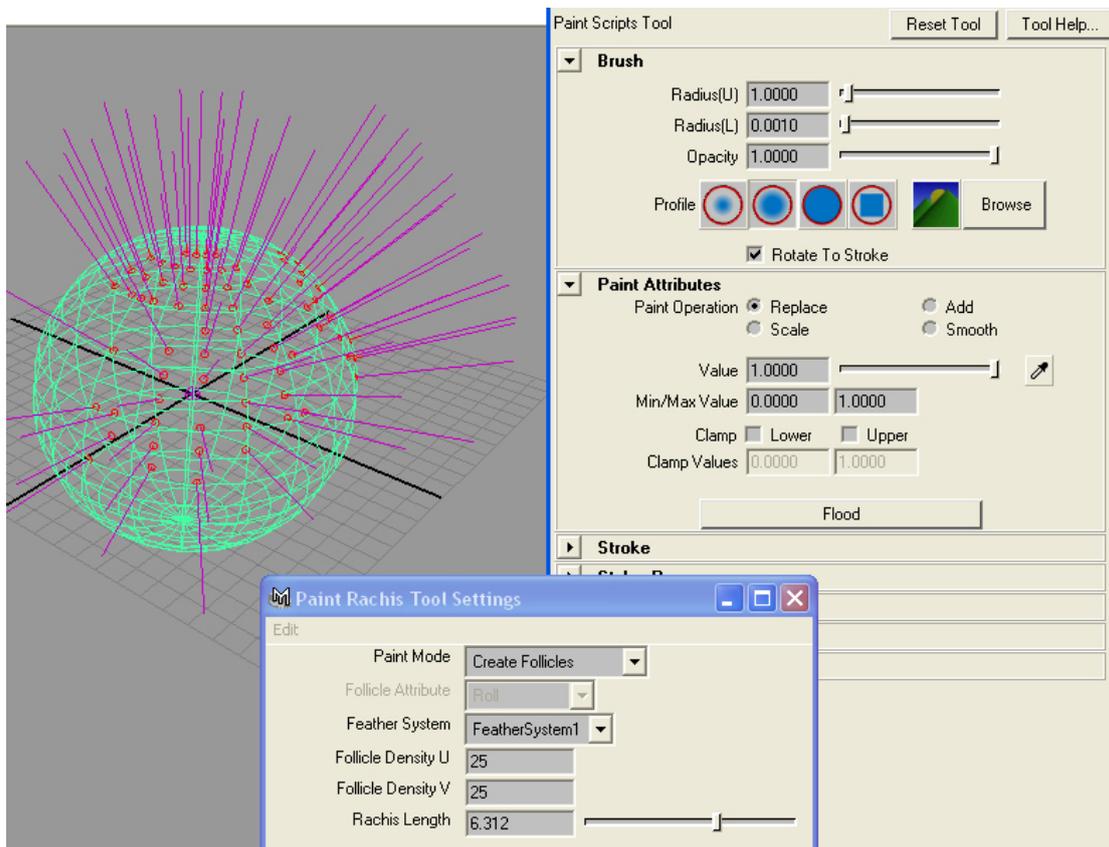
It is important that the Feather Detail DSO, is kept in a central location, which can be accessed at render-time. This location can be anywhere, but it must correspond with the procedural search path generated by the Feathers RIB exporter.

3. Painting the Feathers

3.a Positioning the Rachis

First the user needs to select the geometry they wish to paint on, by clicking on it in the viewport or via the outliner.

Once a target geometry has been selected then it can be painted on. The user needs to choose the **Paint Rachis Tool** option from the **Feathers** menu. This brings up the familiar 3D Artisan Paint Tool used to paint the feather follicles onto the surface of the geometry.

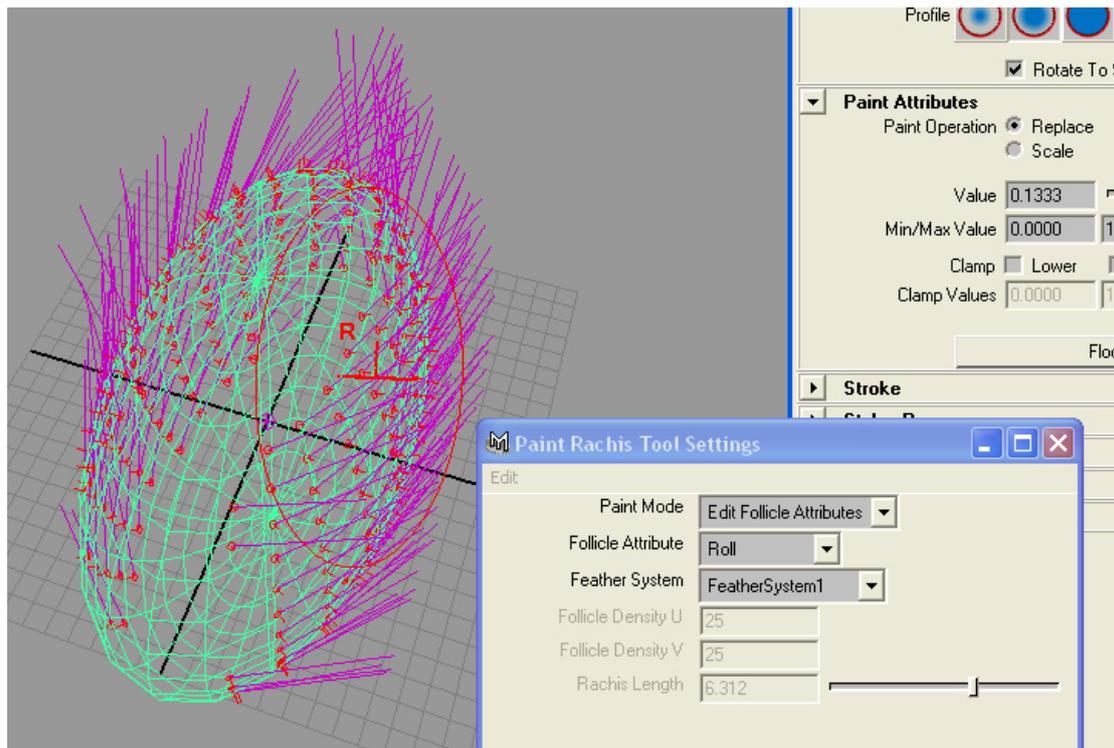


If the surface has no feather system already attached to it already, then the Paint Mode will be automatically set to **Create Follicles**. The user can then set the U and V density values, thus controlling the amount of follicles applied to the surface. The length of the Rachis can also be set at the time of follicle creation.

More than one Feather system can be applied to a surface, which allows the dynamics of the feathers to be controlled more finely if necessary.

3.b Grooming the Rachis

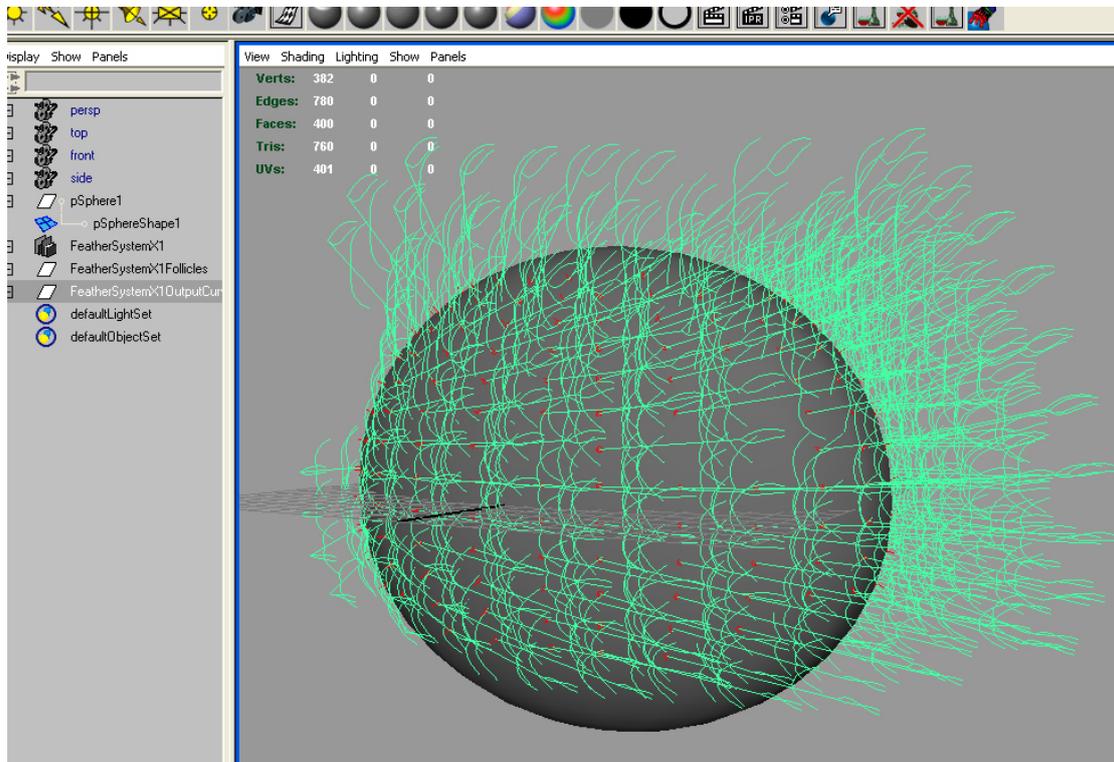
To groom the Rachis generated by the follicles, the user must change the Paint Mode to **Edit Follicles Attributes**. This then gives the user another four options from the Follicle Attribute drop-down menu. There three rotational options, **Roll**, **Inclination**, and **Polar**. The fourth option is **Rachis Scale**, which controls the length of the Rachis. Each of these follicle attributes can be changed by moving the **Value** slider found under the Paint Attributes section of the 3D Paint Tool menu.



3.c Adding the Barbs

To attach the control barbs to the feather's rachis the user first needs to select the Group of **FeatherOutputCurves** which contains the rachis curves.

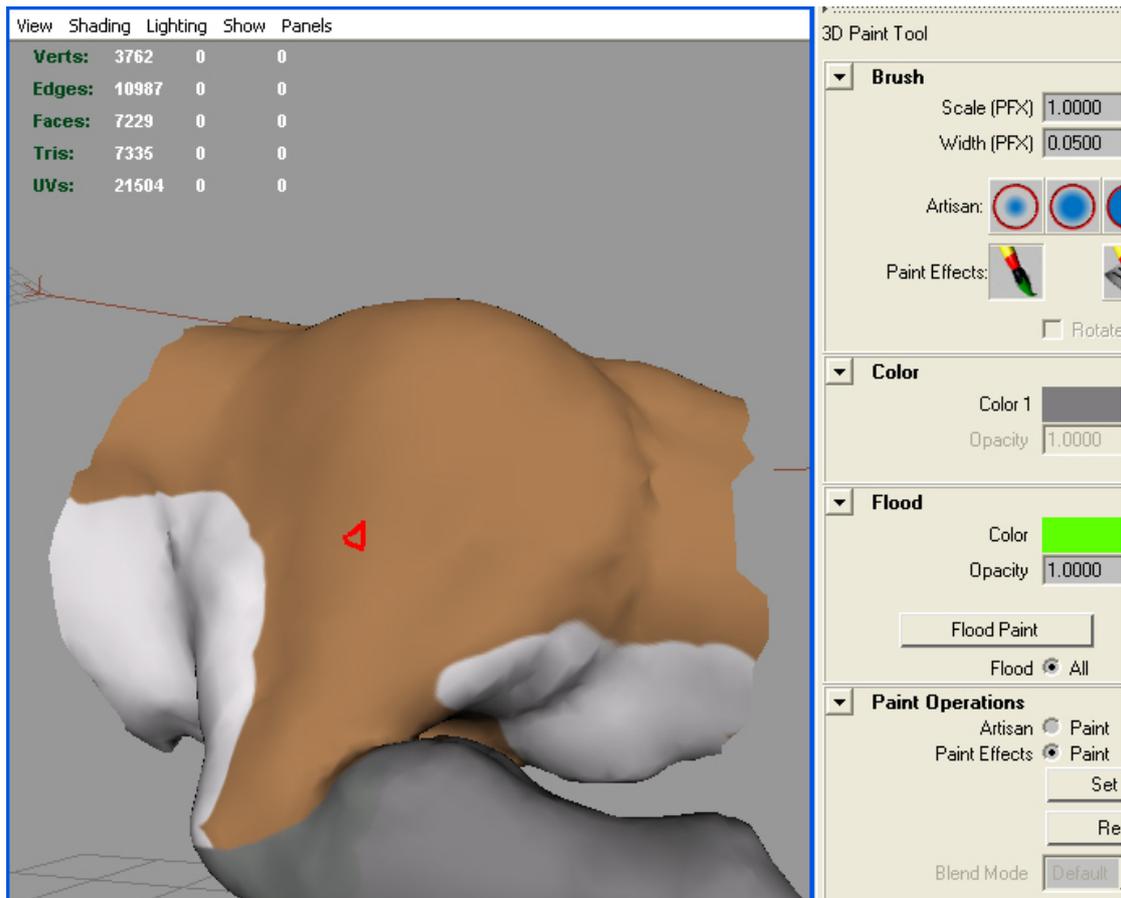
Then a second selection, using **ctrl + lmb**, is needed for the shape node of the target geometry. Once these two objects have been selected the user can use the **Create Feather Barbs** option from the **Feathers** menu. Depending on how many feathers there are on the model, there may a pause before the barbs are displayed.



2.d Assigning Feather Colours

The assignment of the colours for the feathers is done by using a image file. This most effective way of producing a useful image map is to use Maya's 3D Paint Tool and paint colours directly onto the surface geometry. This can be achieved by selecting the **Rendering** Menu Set and from the **Texturing** menu, choosing the **3D Paint Tool** with the Options box. This is the Paint Tool menu. The user will not be able to paint anything onto the surface until they have assigned a texture to it. This is displayed as a warning in the Command Feedback line at the bottom of the Maya UI. To rectify this problem, the user needs to click on the **Assign/Edit Textures** button under the File Textures tab. This brings up a window where then user can set the dimensions of the texture. To comply with the current pipeline, the texture needs to be 256x256. The texture also needs to be called a specific name,

which is feathersMap.iff and found in the /images directory of the current working project. To rename the texture file, open the **Hypershade** from the **Windows** menu and under the **Textures** tab there should be the texture just painted. It will be called file1, if no other textures exist. Hold down the **RMB** and choose **Test Texture**. This brings up a render view with the painted texture image in it. From the **File** menu select **Save Image...** and save it with the specified name and location.



4. Rendering the Feathers

4.a Exporting the RIB

To export the feathers in the form of RIB files the user must select the Group of **FeatherOutputCurves** which contains all the rachis and barb curves. The next step is to select the **Export Feathers to RIB** option from the Feathers menu.

The RIB files will be written the /rib directory of the current working project.

4.b Feather Shader Parameters

The feather_fur shader has several parameters that the user can change to alter the look of the final image. Firstly, there are the standard **Ka**, **Kd** and **Ks**, which control the amount of ambient, diffuse and specular light is captured in the colour calculations. The two **SPEC** and **roughness** parameters are used to create separate specular highlights from that of the default.

The **start_spec**, **end_spec** and **spec_size_fade**, are used to vary the amount of specular light appearing along the length of the curves.

The **illum_width** is an angle used to consider only the lights which are within this angle based on the curve normal at the current point.

The **var_fade_start** and **var_fade_end** parameters are used to control the darkening effect by blending them together to achieve a sense of depth to the curves.

The **rootcolour** and **tipcolour** parameters control the how the colour blends from root to tip. The **base_colour** parameter passed from the RIB is added to the previous two parameters' colours to display the final colour of each curve.

The **surface_normal** parameter is also passed from the RIB allowing the shader calculations for determining specular highlights on the flat 2D ribbons (RiCurves).

5. List of Resources

MEL

- `addBarbs.mel`
- `assignFeathersColour.mel`
- `createFeatherCurveNode.mel`
- `feathersMenu.mel`
- `paintRachisTool.mel`
- `rachisCurvePaint.mel`
- `writeFeathersRIB.mel`

Maya Plug-ins

- `ClosestPointOnMesh.so`
- `Feather.so`

Renderman

- `Feather_detail.slo`
- `Feather_fur.slo`