Intermediate

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MeshMan

This is an intermediate four part tutorial. Part one explains the basic of how Amorphium Pro creates mesh. Part two explains when, why and how to use the MeshMan Tools. Part three shows some ways to use the MeshMan Tools for rendering effects, modeling and texturing techniques. Part four is a quick projects (Disintegrating a planet)

Part two

The Mesh Man Tools
These tools (located in composer) are used to manipulate mesh at the polygon level. Their main propose is to fix imported meshes so the can be properly used in Pro. But they can also be used to make local meshes more suitable for your needs, and to help you control file sizes of the objects and models you create and export out of Pro. Latter in the tutorial I will show you some unique effects you can create with some of them.

All of the MeshMan tools are used by selecting the tool then clicking on an object.

Fig. 2

Decimate Tool
The first tool is the MeshMan Decimate tool. It is used to decrees the number of polygons in an object.

Fig. 2_2

This tool will divide the number of polygons by 4, example: if you started with 400 there will be 100 left after the decimate tool is used.

The Decimate tool is the only MeshMan tool that has further properties.(indicated by the red dot) If you right click on the tool a menu will pop up which gives the option of protecting the edges through the transformation process.

Fig. 2_3

The edges protected are the outside edge of the object, not the edge of the polygons themselves. This option is checked by default, and you should always use it on synthetic meshes with double points on the edges.

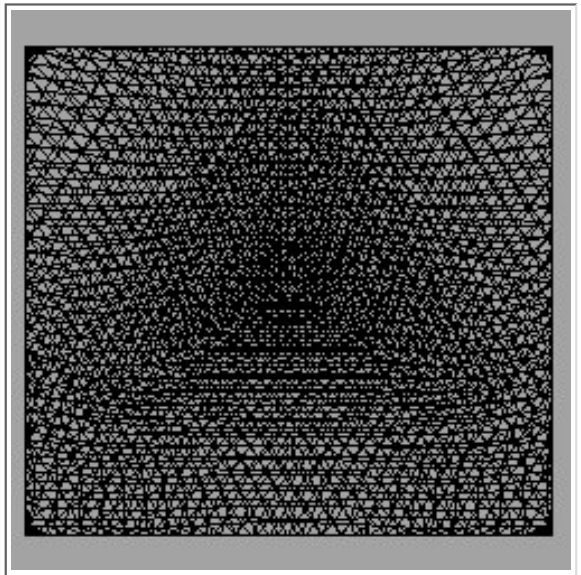

Fig. 2_ Before

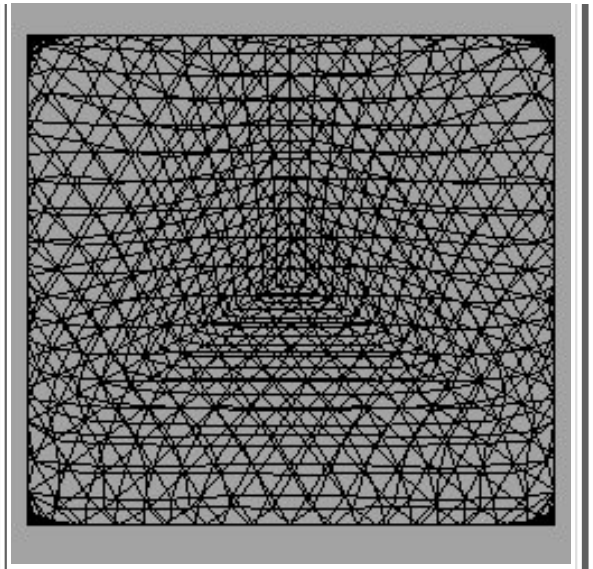

Fig. 2_5 After

Although most imported meshes won't need to have the polygons count decreased, Pro's organic and synthetic have fairly high polygon counts compared to other apps. This tool can help you keep the file size down on models with many parts, some of which may not need high polygon counts. Example: you may use a cube to make the frets of a guitar, which have no detail or complicated shapes. By decreasing the polygon count on the first one then duplicating it for the other 23 you will drastically decrease the size of the file when you save or export the model. Some 3D apps have a smooth option that will smooth out the rough look exported objects may have with lower polygon counts.

Quad Tool
The quad tool will increase the polygon count by multiples of 4. Example: if the mesh has 10 polygons the quad tool will increase it to 40 the first time used, used again it will increase the polygons to 160 and so on.

This tool is used the increase the polygon count on imported meshes so they will better take the sculpting brushes and FX distortion tools. It can also be used to raise the polygon count on local primitives, so they can be deformed and sculpted into more complex shapes with better detail drawn on them. If the object appears rough after the polygon count is increased it can be smooth out using the FX smooth tool or the smooth brush in the Tools workspace. Increasing the polygon count to high will cause the performance of the computer to slow down, and may even inhibit your drawing ability by not being able to update the real-time fast enough.

The polygon count can be viewed or checked on an objects properties menu, Info tab.

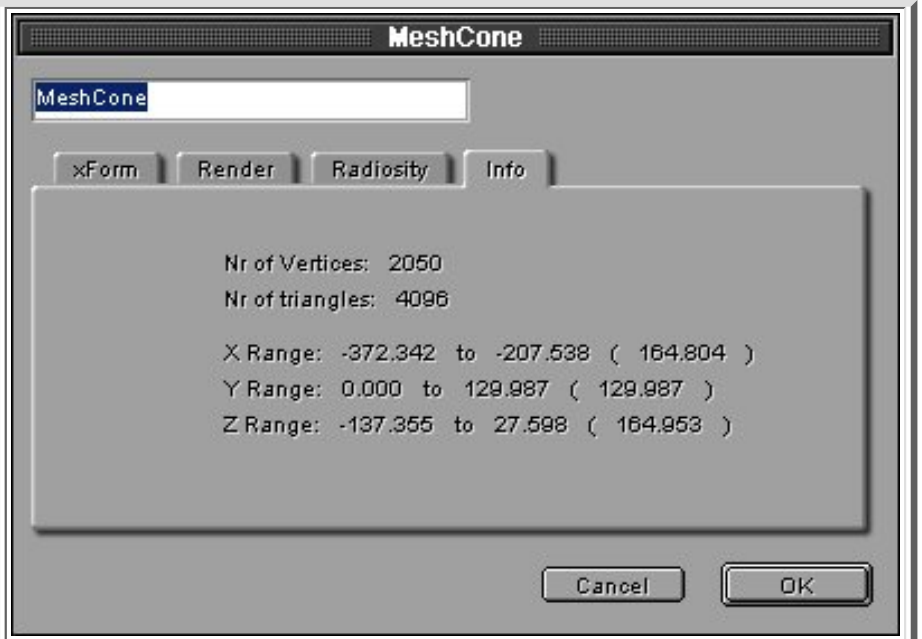

Fig. 2_7

The number of Vertices : refers to how many places the polygons meet.
The number of triangles : refers to how many polygons there are.
X Range : refers to the width
Y Range : refers to the height
Z Range : refers to the depth

Weld Vertices
This tool will weld the vertices of a imported mesh together, or weld the vertices back together if the break triangles tool has been used on a mesh.

Fig. 2_8

If the imported mesh seems to crumble when it's morph, smoothed, brushed or distortion tools are used on it, using the weld vertices tool on the mesh will fix it. When the vertices aren't welded together the polygons will not stay together at the vertices. The edges of the polygons themselves are effected, moving or shrinking them away from each other. This is how I showed the examples at the beginning of the tutorial.

Here (Fig. 2_9) I have imported a poser figure then used the flatten hierarchy tool on the hip to turn it into one whole mesh.

Then when I used the FX smooth tool on it, the pieces that where individual mesh before flattening, crumble or shrink away from each other.

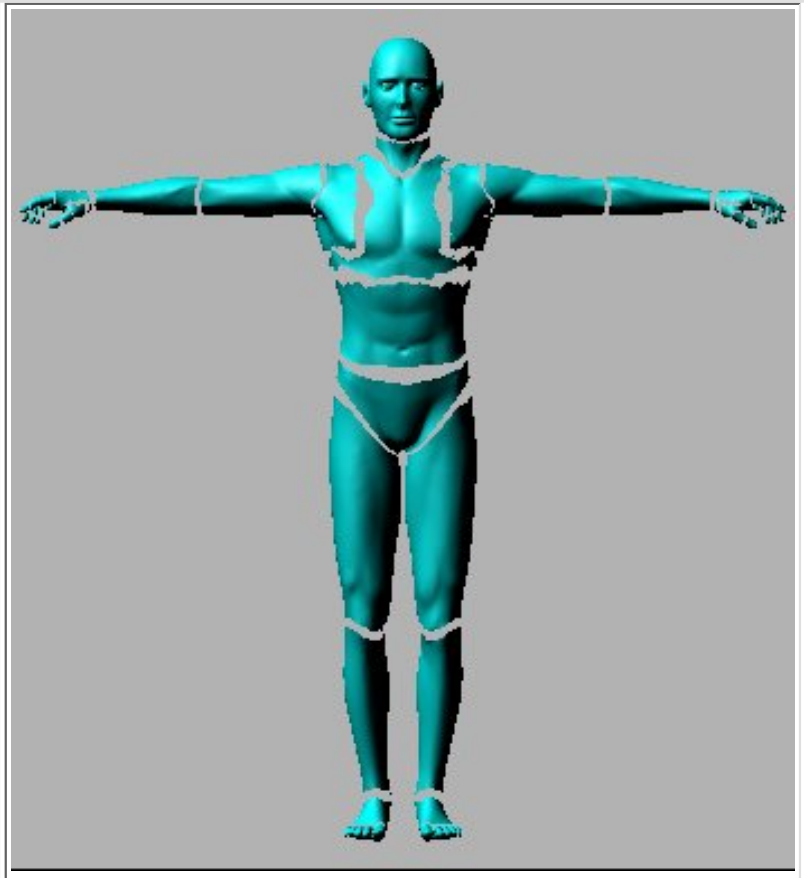

Fig. 2_9

Using the weld vertices tool after flattening the hierarchy will weld the polygons at those joints together, which fixes that problem. Then when the figure is smooth with the FX smooth tool, (Fig. 2_10) it responded like a normal whole mesh.

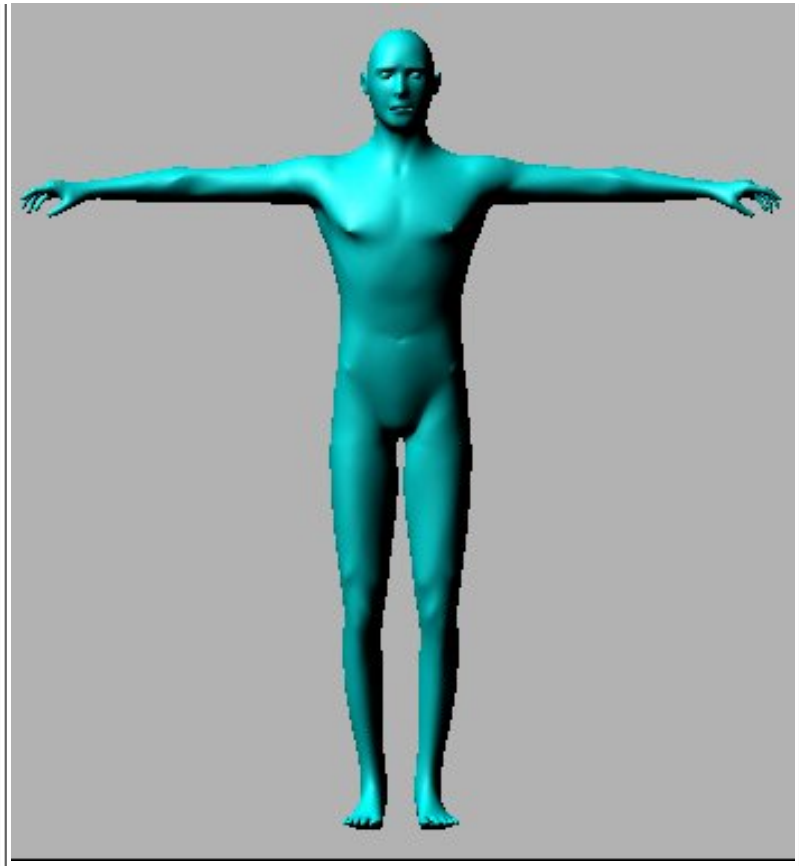

Fig. 2_10

One indication that an imported model triangles may not be welded together, is the model will look course or rough like it needs to be smoothed. (see fig. 2_12)

Break Triangles
This tool will break the triangles (polygons) from each other. Basically it does the opposite of the weld vertices tool.

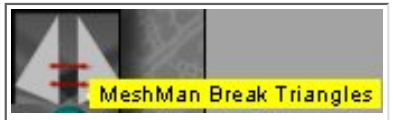

Fig. 2_11

A few things you will notice when this tool is used on a mesh, is the mesh becomes very rough, course or bumpy looking. Fig. 2_12

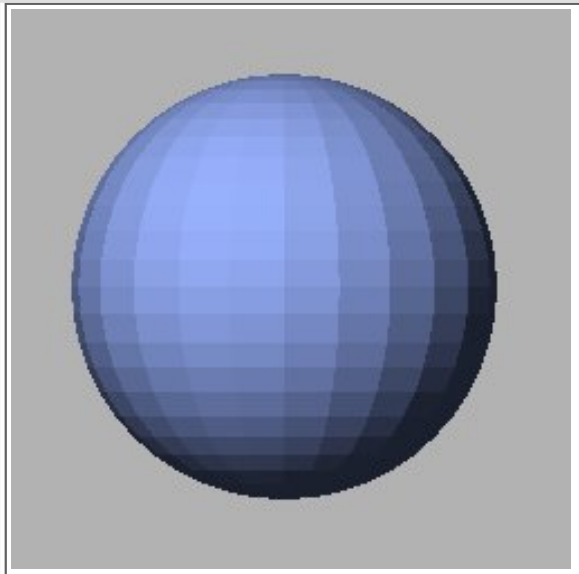

Fig. 2_12

Also the number of vertices has increased drastically, while the number of triangles remained the same.

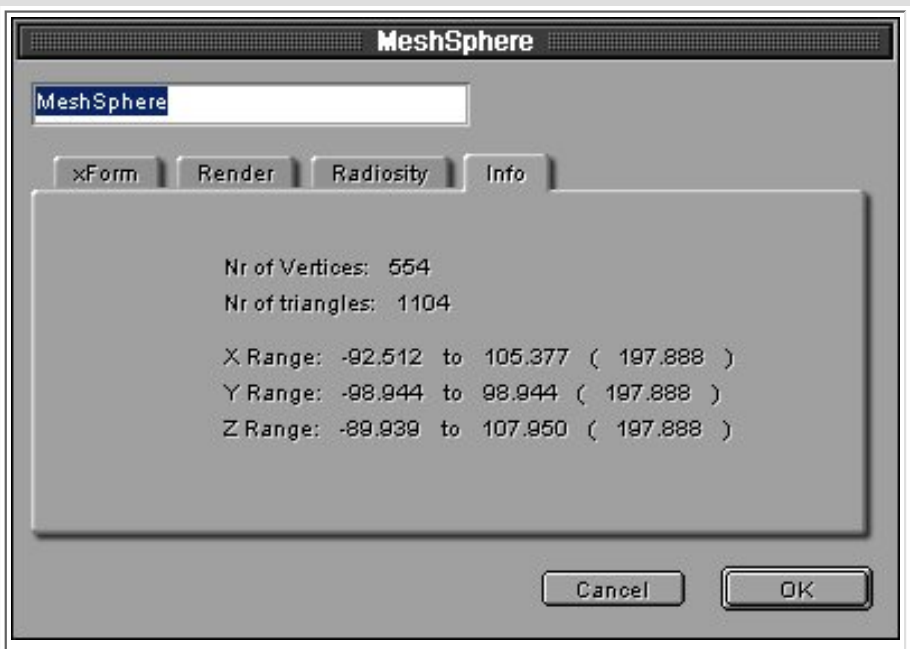

Fig. 2_13 before break triangles tool was used.

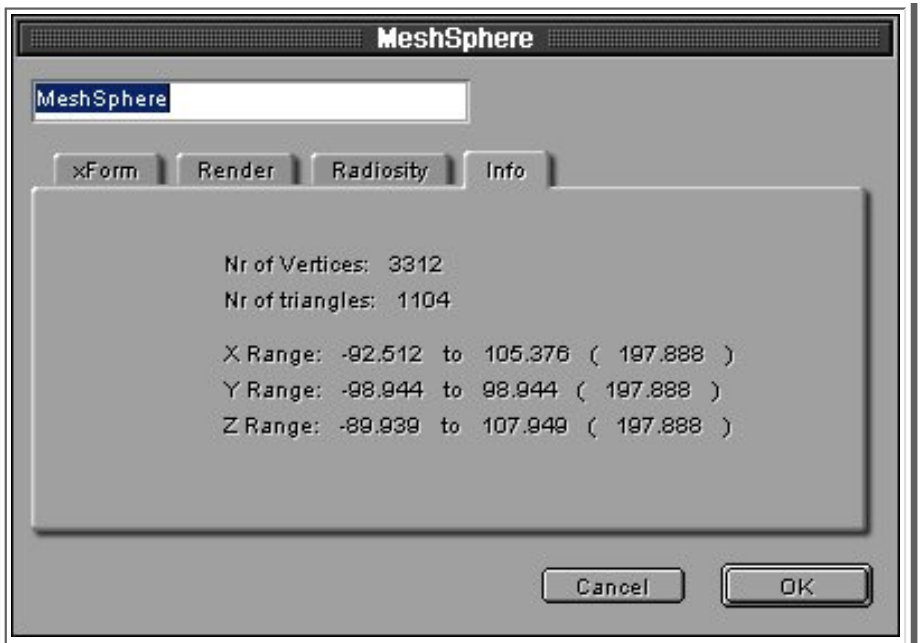

Fig. 2_14 after break triangles tool was used.

The reason the number of vertices increases while the triangle stays the same is because with the vertices not welded, each corner of the triangle is considered a vertices now. Fig. 2_15 If you times the number of triangles (polygons) by three that will be the number of vertices.

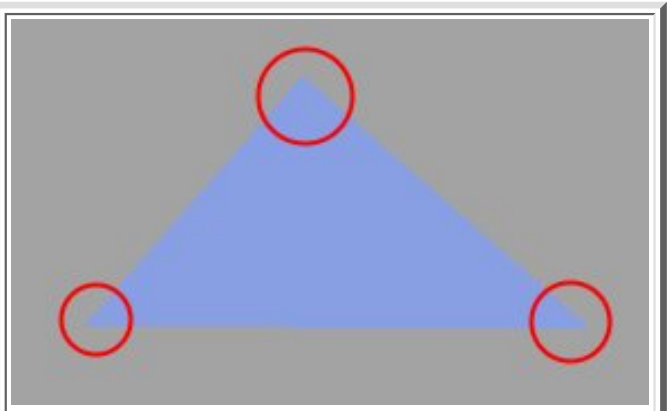

Fig. 2_15

For the most part the Break Triangles tool is used to export objects or models with the triangles (polygons) broke or not welded together. But as you will see latter in the tutorial some unique effects can also be made using it.

Invert Normals
This tool will invert the normal of all the polygons in the mesh. In other words it flips all the polygons around to face the opposite way.

Fig. 2_16

Here is a model with 3 parts, a hollow cylinder with endcaps on both sides. The two end caps have the normals reversed, Fig. 2_17 so your actually looking though the cylinder and seeing the back end cap. The end caps should have the normals facing the other way.

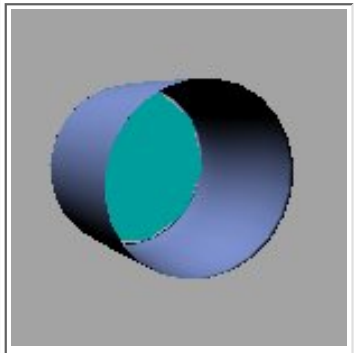
Fig. 2_17

After using the invert normals tool on the back end cap you can see that it now appears to be invisible, Fig. 2_18 but really it's normals are now facing the right way. Because you shouldn't be able to see it on the inside only on the outside.

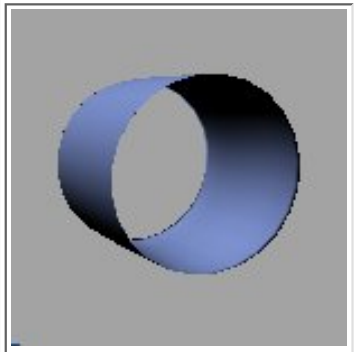
Fig. 2_18

Then after using the invert normals tool on the endcap on the front side, the model is fix so both endcaps can be seen from the outside of the model. Fig. 2_19

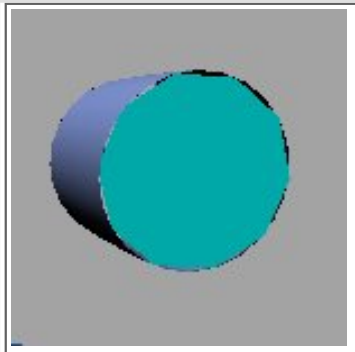

Fig. 2_19

Although you may be able to see the object with normals that are facing the wrong way when they are rendered.

More than likely when you apply a texture to the object it will be backwards, since when it's facing the proper way you can't see it. So the chances are, the texture will get mapped to the wrong side. Mapping to the visible side of an object with backwards normals will make the texture backwards and flipped around when rendered. Fig. 2_20 and Fig. 2_21

Fig. 2_20 Normals correct, texture mapped correctly.

Fig. 2_21 Normals wrong, texture mapped incorrectly.

Just because you may not be able to see some parts of an imported model, does not mean the normals are wrong.

It could just be the angle the model is being view from. Many 3D apps do not create mesh plan objects with two sided mesh like Pro does. So although some parts may not be visible in the workspaces they do not need to have the normals inverted. Fig. 2_22 and Fig, 2_23 is a close up of a tree which does not need to have the normals inverted.

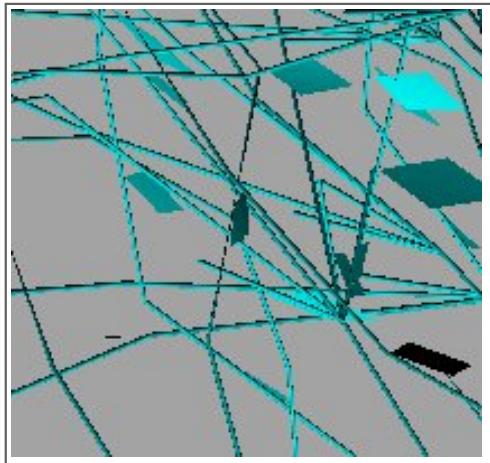

Fig. 2_22 a tree not rendered

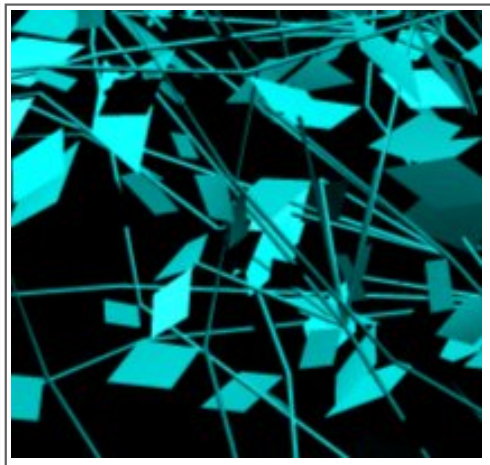

Fig. 2_23 same location of the tree rendered

Fix Normals
The fix normals tool only inverts the normals that are wrong in an object.

Fig. 2_24

Some 3D apps can create models in groups of polygons or even one polygon at a time. Sometimes a few polygons can get turned around and are facing the wrong way. The chest and left shoulder area of this frog (Fig. 2_25) look invisible which indicates the normals are facing the wrong way.

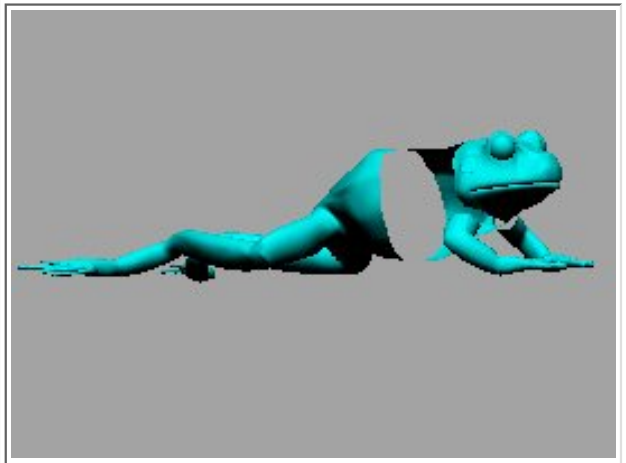

Fig. 2_25

Using the fix normals tool, inverts only the normals in the areas that are wrong, fixing the polygons which are backwards.

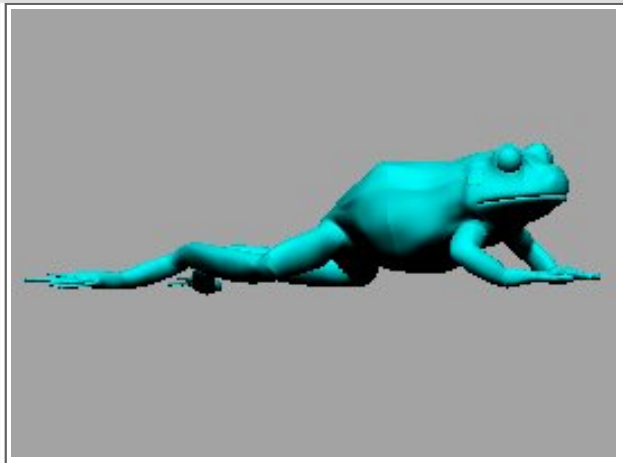

Fig. 2_26

If parts of a model look shaded black, it indicates that there are wrong normals. Use the fix normals tool will correct them.

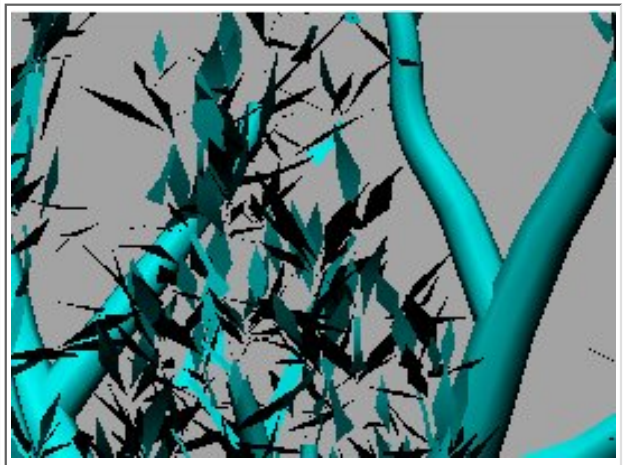

Fig. 2_27 normals wrong

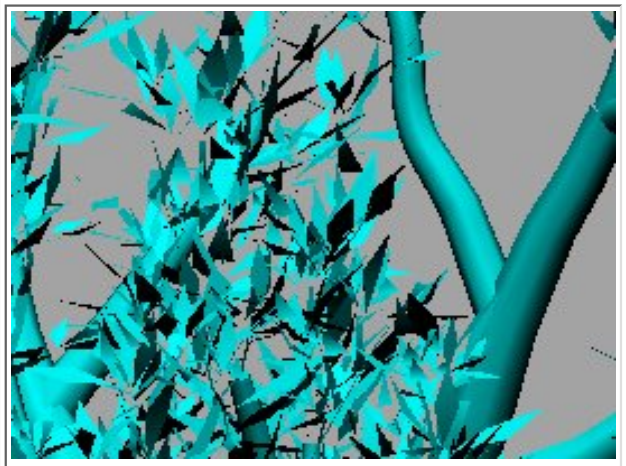

Fig. 2_28 normals corrected

Mirror Tool
The mirror tool will mirror or swap the right and left side of the object.

Fig. 2_29

Here I posed a figure in poser (Fig. 2_30) then exported it as an obj.

Fig. 2_30

But Poser exports the obj format reversed, so when it's imported into Pro the figure looks like the two sides have swapped places. What was on the right in Poser is on the left in Pro. So I painted each part, then flatten the hierarchy. Fig. 2_31

Fig. 2_31

Then used the mirror tool to change the figure to the way it was posed in Poser. Fig. 2_32

Fig. 2_32

Continued

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