Using fur descriptions in Maya
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We explore Fur, a very creative component that can be used to produce a wide range of 3D renderings and animations for grass, plants, hair, paper... and fur.

Fur has a few trade offs
- slow to render, make sure to sample your fur settings density and global scale properly
- works only on Nurbs and polygons
- needs a careful UV remapping of your 3D model.

Part 1 covers basic parameters for fur creation
Part 2 covers how to control fur with painting 2D maps
Part 3 covers how to apply fur on a 3D model

**Part 1 parameters for the creation of fur**
Let's create a patch of tall grass with lighting

Go to Create > polygon primitives > plane.
Please note that Fur Description is assigned to a specific shader. Fur descriptions will be applied on selected surface shaders. For example, you can apply fur on the top of the box. Create a box, select the surface on top of the box, assign a new shader. With the new shader selected, apply fur.

Let's go back to the plane. Select the plane, go to Rendering > Fur > Attach Fur Description > New.
Troubleshooting, if you don’t see the spikes of fur, they may be pointing the other way. Select the plane, go to Edit Polygons > Normals > Reverse.

Let’s color the grass with a color gradient from base to top.

More parameters… Add Tip Curl and Scraggle. Let’s render with Density = 100 (Density is located on the top of the parameters window for Fur Description)

Crank up Density to 10000
Crank up Density to 20000. We can revisit the Base + Tip Color and Width.

Let's change the color, add some clumping and a spotlight.
Select the spotlight. Go to Panels > Look through Selected

Move the viewpoint as seen through the selected spot Light. This allows selecting the area lit by the spotlight. Go to the Attribute Editor change Cone Angle and Penumbra. Reduce Intensity < 1. Go to Fur
Shading Shadowing, Fur Shadow Type > select Shadow Map. Add a lighting intensity which will be specific for the Fur.

With the spotlight selected, go to Rendering > Fur > Fur Shadowing Attributes > Add to Selected Light. Go to Rendering Settings > Common > Render Options > uncheck Enable Default Lighting. This insures to render only the spotLight.

Render the spotlight projection on the fur.

More parameters for a patch of green grass.

**Part 2- controlling fur with 2D painting**
Interactive painting of grayscale maps can create clearings in the fur

Go to Create > Nurbs Primitives > Sphere. With the sphere selected, go to Rendering > Fur > Attach Fur Description > New. Play with the inclinaison, roll and polar.
Create a pointLight. With the pointLight selected, go to Rendering > Fur > Fur Shadowing Attributes > Add to Selected Light. Go to Rendering Settings > Common > Render Options > uncheck Enable Default Lighting. This insures to render only the spotLight.

Select the sphere, go to Renderings > Fur > Paint Fur Attributes, select the square. In the Paint Fur Attributes Tool Settings, select Fur Attributes > Baldness to remove fur from areas of the face for example eyes and mouths… Select a paint brush and a Paint Attribute Value in order to outline in paint in gray or black the areas without fur or hair. Please note that you can decrease the hair by flooding the 3D sphere
Go to Display, check Color Feedback to follow the map as you paint.
Select the sphere, go to Renderings > Fur > Paint Fur Attributes, select the square. In the Paint Fur Attributes Tool Settings, select Fur Attributes > Direction in order to change the direction of fur around the bald areas.

Rendering with Baldness and direction maps. About rendering: Start with low Fur density for faster rendering preview.

Part 3- Applying fur on a 3D model
Reminder, fur works only on Nurbs and polygons. I strongly suggest using polygons. The following illustration shows what you don’t want to see on your model.
Step 1, select the 3D model as an object – green selection mode - go to Modeling > Modify > Convert > Subdiv to Polygons
Step 2, go to Polygons > Smooth
Step 3, go to Edit Polygons > Normals > Average Normals

Step 4, select a UV projection system. Choose between planar, cylindrical, spherical. Please note that the cylindrical and spherical projection systems cover half of the model by default. You need to select the handles and slide the manipulators in order to cover the second half.

Step 5, go to Rendering > Fur > Attach Fur Description > New