

Tutorial for Modeling Human Faces: “SKY LARK”

This tutorial describes most all of the steps to create a realistic face with MH3D. In this session, I will be creating a new character called Sky Lark. The very first steps that must be taken deal with the characteristics of the character. There are questions that you must ask yourself.

Some will be obvious:

- Will it be male or female?
- Will it be young or old?
- What color would it be?
- What kind of skin?

Other questions will help you in the long run of dealing with your model, such as:

- Will it talk?
- Will it blink?
- What range of personalities will it have?
- Will it be realistic or cartoonish?

Knowing these answers will help you in designing your model and will ultimately save you time. For example, if your character won't talk, then why bother making the mouth open at all?

Let me define the character we will be making. It will be a female secret agent with blue-sky skin. She will have dark blue hair with a professional sophisticated look.

The next step is to actually attempt to draw a picture of your character or find a picture which will assist your modeling. Try to imagine and animate it in your head. Once this creative part is complete, we can begin the technical part.

We will start with the face as we did with Xemo. Draw an outline of the face and draw 2 circles for the eyes and 1 for the mouth (see Figure 1). Why do it this way, you ask? Why not lathe a sphere and pull points? Well, for one thing, to me, that's like a guessing game. You will probably end up starting over many times when you find out that you don't have enough splines, or too many. It's better to start from scratch and build up, especially with realistic faces. For cartoon characters, sure go ahead and make bubble eyeballs, since that's the look you are going for, but for humans, bubble eyeballs look rather odd.

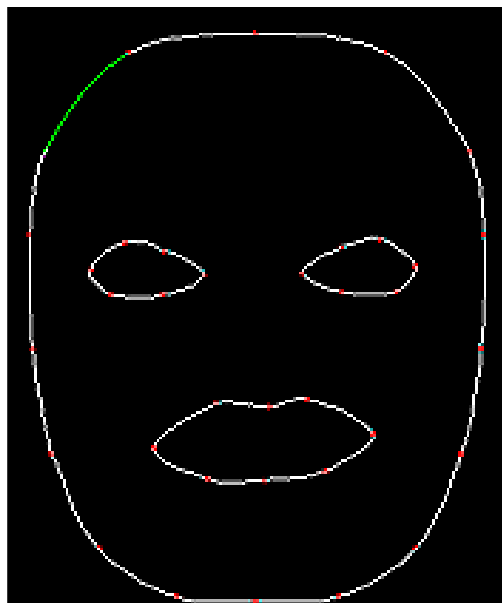


Figure 1

At this point, you should think about how many control points you want for the eyes and mouth. We have yet to see the face, so don't worry too much about how many control points you have, as long as they are symmetrical. It may help to use a scanned image as a template to get things proportional, but it is not important now.

The next step will be to add some more definition to the eyes and mouth. Surround the eyes and mouth with similar circular splines (see Figure 2). Nothing will render at the moment, because we have not created any 4-point patches.

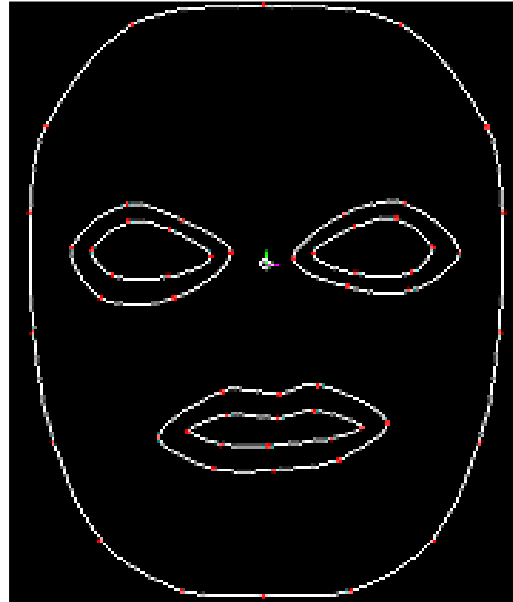


Figure 2

Now, add some vertical splines to create renderable patches (see Figure 2a). As you can see, I leave the ends of the spline hanging off the edges. These are "handles" that allow you to differentiate between splines. It looks crowded now, but when your model gets more complex, these handles will help you figure out what spline is what. If you render the model now, you will see that only the 4-point patches will render, so only the outlines of the eyes and the mouth are visible (see Figure 2b).

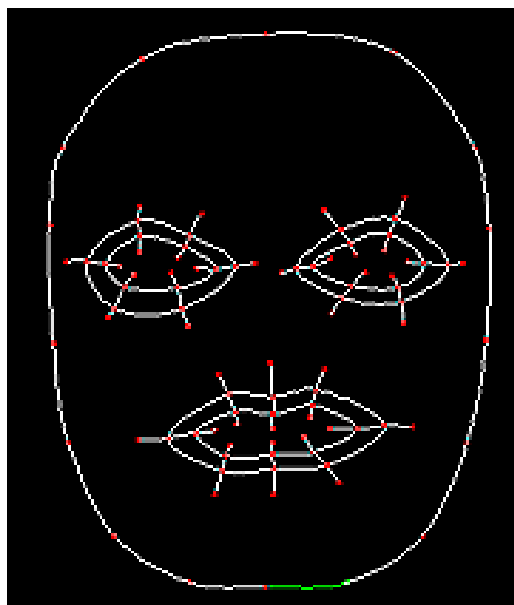


Figure 2a



Figure 2b

The next few steps are the most difficult. Now we actually build the face by adding more connecting splines (see Figure 3). This can be quite confusing, and quite puzzling. My suggestion is to connect the splines that create obvious 4 point patches first. Most of the time, your non-rendering patches will be 5-point patches. An easy way to get rid of these is to delete the control point on the spline defining the face leaving a 4-point patch. If you think this will lessen the detail of the face, adjust the remaining control points and space them evenly. You can also accomplish good detail with the magnitude and gamma buttons later on. There is no one right way to do this. A good rule of thumb is, if the entire face renders and you've used all 4-point patches, then you did a good job (see Figure 3a). :)

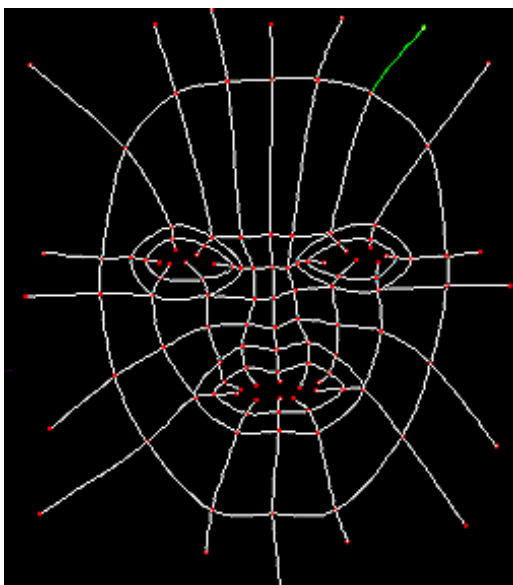


Figure 3



Figure 3a

As you can see, the bulk of the spline density on the figure is around the nose area. We will probably need more detail for the forehead. A good way to do this is to add another circular spline inside the perimeter of the face. This is illustrated in Figure 4. By doing so, we retain our 4-point patches around the entire face while adding more detail to the flat areas.

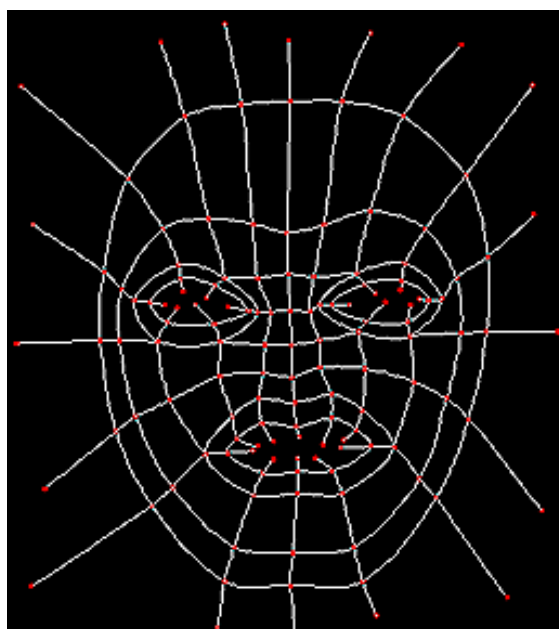


Figure 4

Now that we have a flat face that will render, we can elevate the control points and bring our model into the 3rd dimension. A good place to start with is the nose since it sticks out the most. Select the control points that you want to pull, switch the view to a profile, and pull them out. It sounds simple, but now you have to test your skills of observation. No more thinking required. Now you just have to make it look “right”. If you need further assistance, scanning a profile of your favorite person and importing it as a template may help. In addition to pulling out the nose, you may also want to pull in the outer perimeter of the face. Now you have just created a dopey-looking mask (see Figure 4a). Not quite the gorgeous model you expected, eh?

I recommend using the light source from the top when using the preview render. It gives you the most natural look and you can see the depth of the facial features easily. Once most of the face is shaped, be sure to check it with the light source from every direction. You may find a lump or two that needs adjusting.



Figure 4a

Now, as our face comes to visualization, we will begin to notice some unexpected creasing. Creasing is inevitable for the most case, but it's effects can be minimized. For example, look closely at the corners of the mouth (see Figure 5). The right corner (our right) has some noticeable creases on the cheek, and the left corner has a minor crease where the top and bottom lips meet. Well, hey, that's natural, right? The differences in the corners of the mouth are because of rearranging of how the splines are connected as the face is built. Remember how we started with one circular spline for the mouth (see Figure 5a)? Well, as we can see, this created unwanted creases.

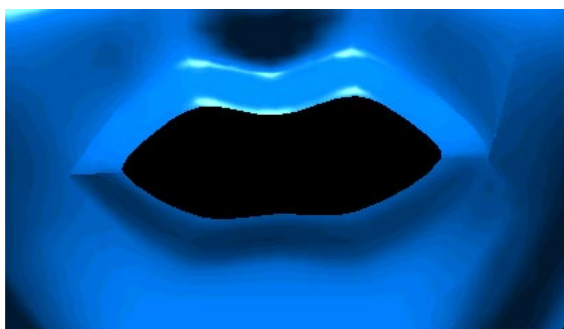


Figure 5

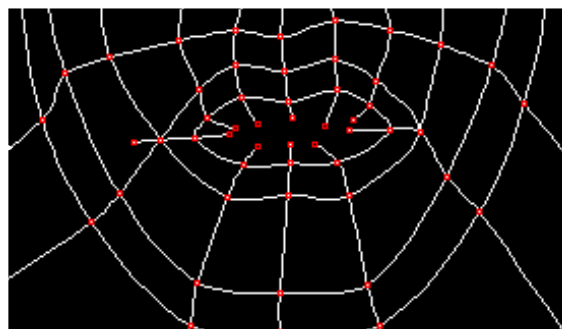


Figure 5a

The creases are fixed by breaking the splines of the lip and reconnecting as shown in Figure 5b. The once singular mouth spline is now broken into 2 splines, the bottom being connected up towards the eye and the top being connect down towards the chin. Be sure when you do this to leave handles sticking out, or you may have problems in connecting the correct splines back together. This method give you a crease on the lip, but hey, who doesn't have one? As a result, we used the crease to our advantage and made our face more realistic. Pretty sneaky, eh?

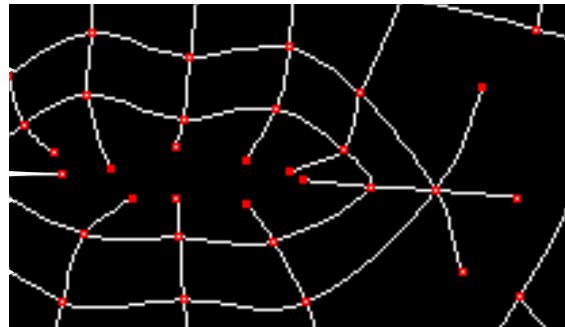


Figure 5b

We now have a model that looks like a smooth mask, and it's time to pay attention to detail. For example, look at the nose. We will add nostrils later, but for now we will define the bottom of the nose a little more. It'll be a good idea to add another spline running across the face (see Figure 6). Remember to leave handles at the ends. It looks ugly now, but later on, it will make your job easier.

Now it's time to utilize the magnitude button to fix what you've always wanted to fix but didn't want to add more splines. We can start by making the tip of the nose less pointy. Click on the control point at the tip of the nose and be sure the horizontal spline is highlighted. That is the one we wish to round out. Adjust the magnitude to about 180, or whatever looks good to you (see Figure 6a).

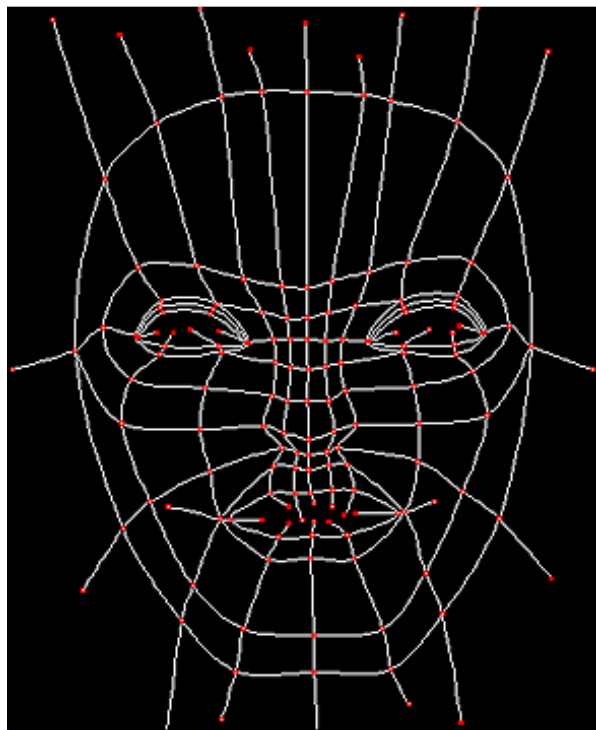


Figure 6



Figure 6a

Knowing that we want to make this face as realistic as possible, we definitely need to add nostrils. If you look at your model, you know you will need to either cut holes in the nose with Boolean techniques, or pull in some control points to form nostrils. Problem is, there is no control point to pull in. Again, we need to add more splines, or resolution. One spline for each nostril is all we need. To make sure our face doesn't have unwanted holes, we need to add a spline running down the entire face (see Figure 7).

Once the splines are added, select the 2 control points above the lip and pull them up to create nostrils. Now that you have 2 holes, adjust the magnitude and gamma buttons to make this nose a cute one (see Figure 7a). Consider yourself a plastic surgeon now.

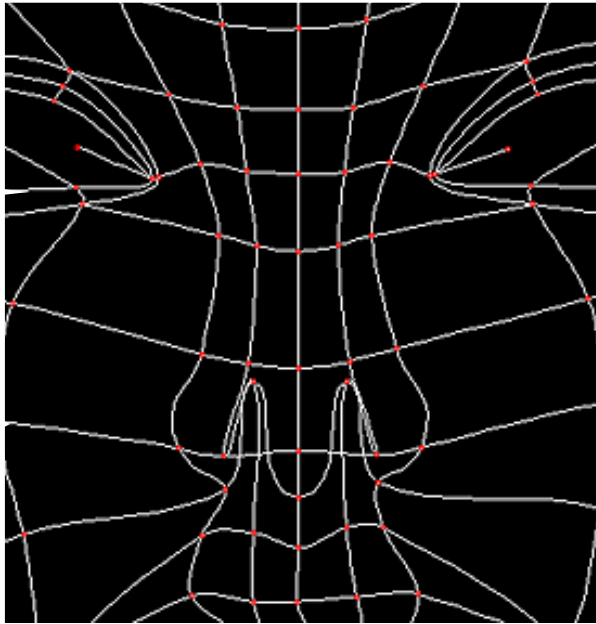


Figure 7



Figure 7a

Next, we'll move on to the lips. Right now they are flat, so we need to add more "skin" as I like to call it. Now is the time to use these handles sticking out of the lips. Create another circular spline inside the mouth with the same number of control points as the surrounding lip (see Figure 8).

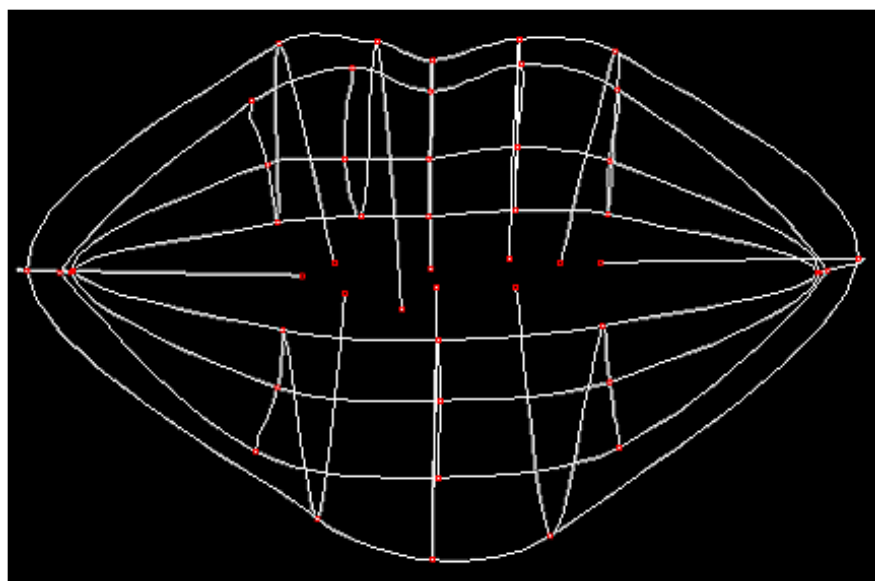


Figure 8

Now attach this circle to the handles of the lip. Keep in mind you still need the handles, so you will need to add a control point to each handle. If you render the mouth now, you will see the lips more rounded. Do this one more time. Once this next circle is attached to the handles, pull in inside the mouth and enlarge it (see Figure 8a). This is the beginning of the inner mouth. If you wish, you may close up the inner mouth and create a pocket. I do this when I am not going to raytrace the model. If I do raytrace it, then you probably won't see the inner mouth due to shadows. For further touch ups, you can change the magnitude to give your face fuller lips. Also, remember to round out the mouth using the top view.

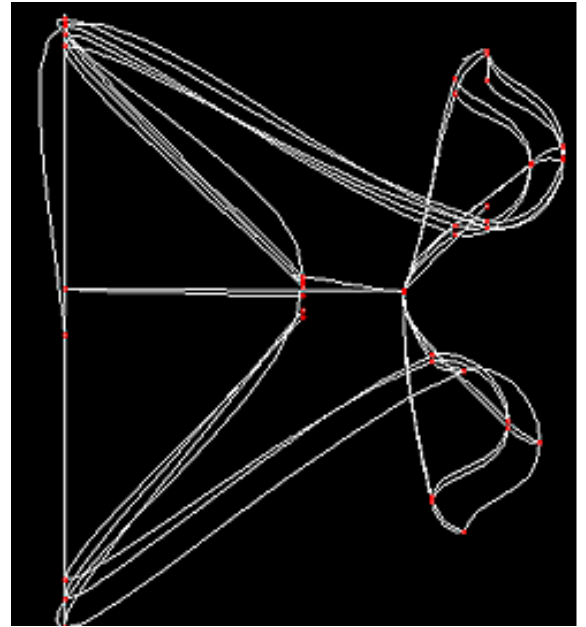


Figure 8a

At this point, you are pretty much done (see Figure 9). One thing you may have forgotten to do is to round out the model, leaving your face looking flat. Try looking at it and making adjustments from the top view especially. We want to make sure the face is pretty much complete before we make the rest of the head, because the less control points we have on the screen, the easier it is to work.



Figure 9

When your nit-picking is done, (and if you are a perfectionist like me, you spend hours on just moving the control points just millimeters) you can now start adding spline skin for the head. To do this, create a circular spline with the same amount of control points as the perimeter of the face. Then attach the circular spline to all those handles sticking out of the face (see Figure 10). When you render it, it really does look like a latex flap of skin you can just pull back (Figure 10a).

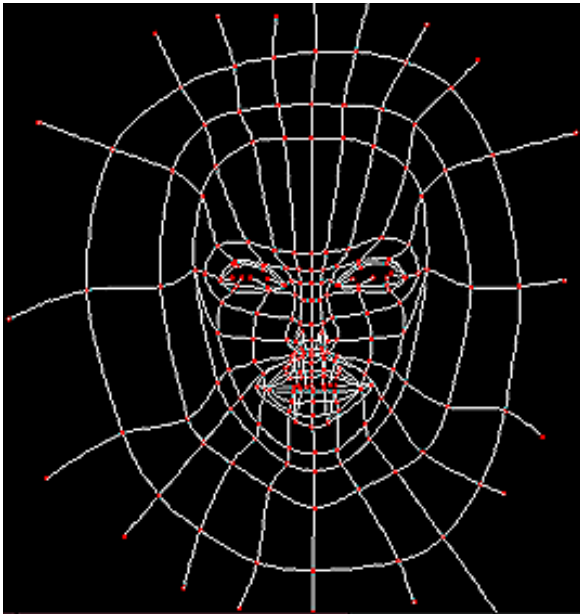


Figure 10



Figure 10a

So do so, and start molding the head (see Figure 10b, 10c). Add more skin as needed by using the same technique. When the head is done (Figure 10d), you may notice some imperfections (Figure 10e). You can either spend the time to fix these imperfections or just easily hide them under the ears or hair that you will create later.

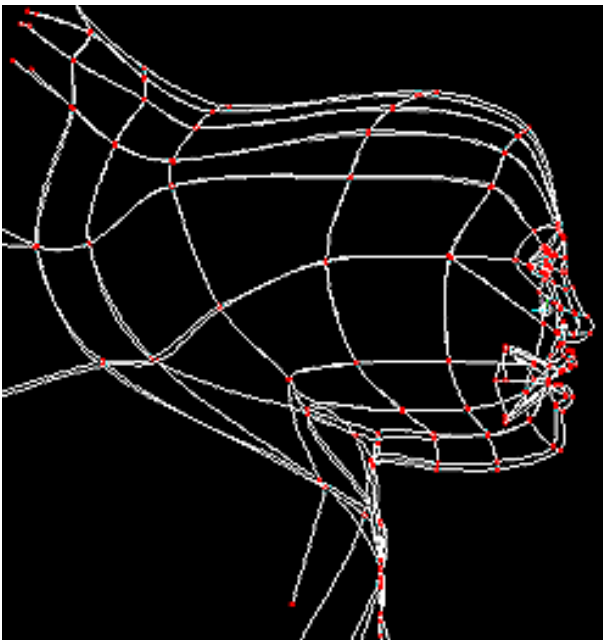


Figure 10b



Figure 10c

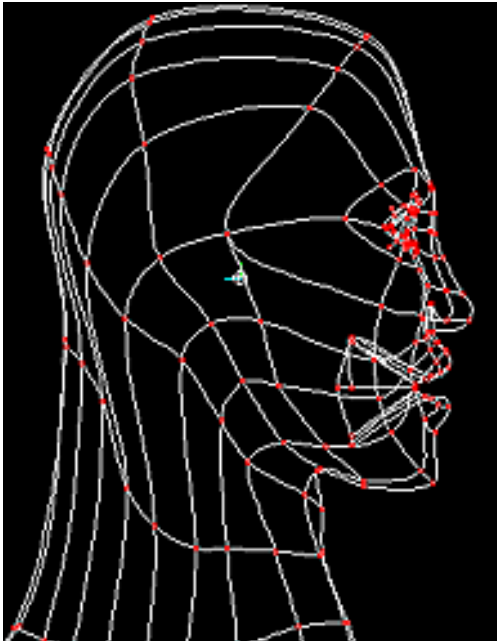


Figure 10d



Figure 10e

For now, let's move onto decalling on the makeup. Select the control points which define the face you created before you added on the head (Figure 11). Once selected, click on the hide button to hide the rest of the head. If you did it right, you will see a model that resembles the face you did hours ago (Figure 11a).

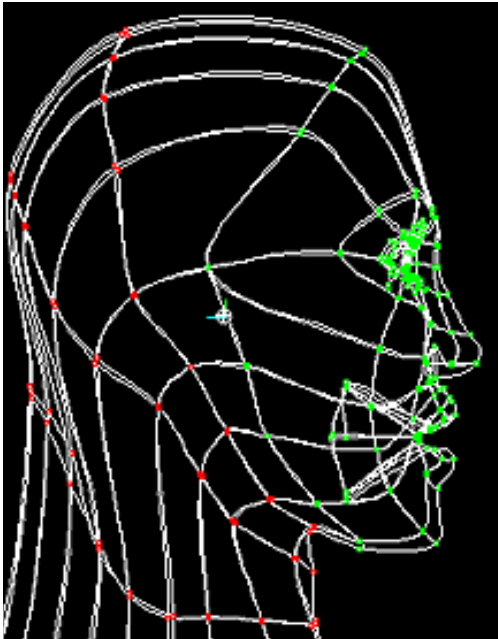


Figure 11

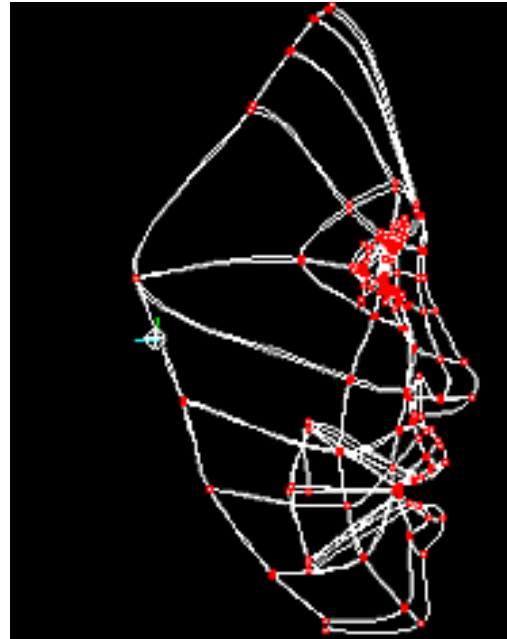


Figure 11a

Now flatten the segment by selecting Flatten from the Segment menu. What you should see next is pretty much a flattened face (Figure 12). If you see otherwise, then your center of gravity (COG) is off place. Make sure the COG is aligned in the center of the face and somewhat behind the face. Flattening this time will ensure you a flat face.

Try to zoom in on the face so that it fills the entire screen without going out. Now do a screen capture. On a PC, use the PRINT SCREEN button to copy the screen to the clipboard. You will have to paste the contents of the clipboard into a program like Lview or Photoshop. I like to use Lview since it's a smaller program to reside in RAM. On a Mac, use COMMAND-SHIFT-3, and you should find a .PICT file on your hard drive.

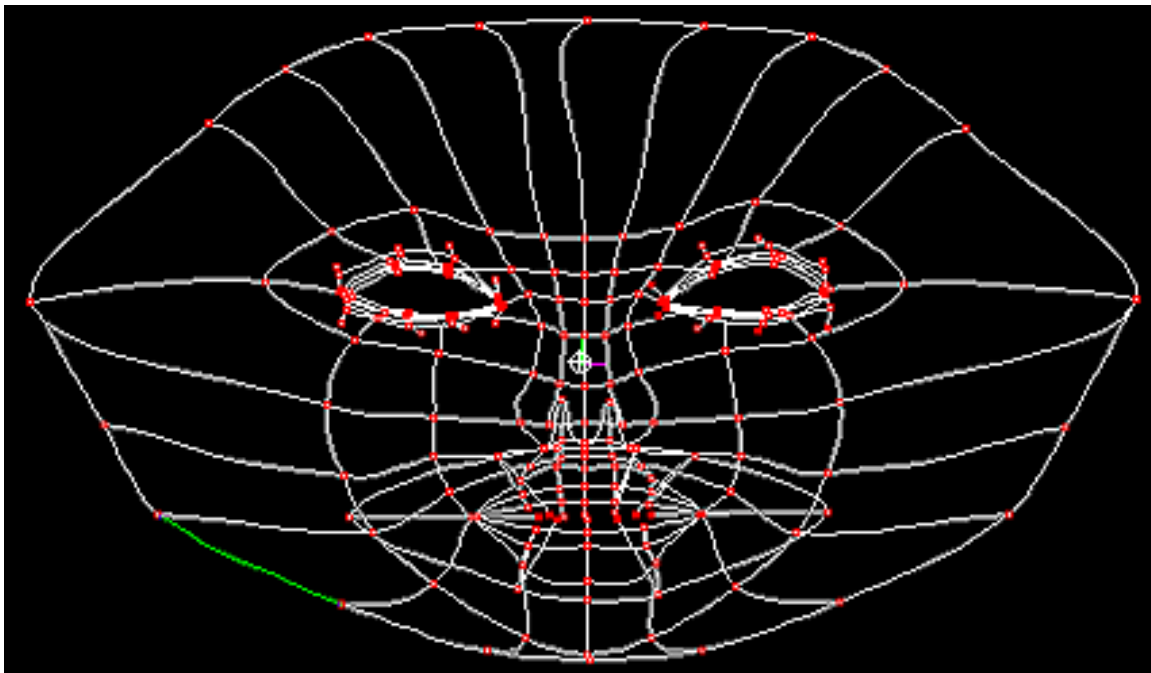


Figure 12

Once you have the screen shot of the flattened segment in a file, you can load it into any paint program and paint away. Photoshop is great for this because you can work in layers without destroying the original spline mesh image. One key thing I'd like to point out: draw the eyebrows directly on top of the control points, that way, you'll be able to move them easily when they are decaled on.

If you are not painting the entire face, you can save memory if you just paint the eyes and the mouth and save them as smaller, separate files. That's why we made sure we captured the screen when the face was zoomed in. A good idea when decaling is to zoom in on the wireframe, select View from the Edit menu, and make a note of the Zoom value. After you've made your decals, you can then go back into the View menu, and type in the zoom value you wrote down, allowing precise decaling.

Eyebrows and lips are easy. I added a bump map to the eyebrows to give them a less flat feeling (Figure 13). To make a bump map in Photoshop, you can just turn the decal map into a negative and remove all color by turning the saturation to minimum (Figure 13a, 13b). Then you will have white eyebrows to give elevation. Be sure to assign this picture as a bump map.

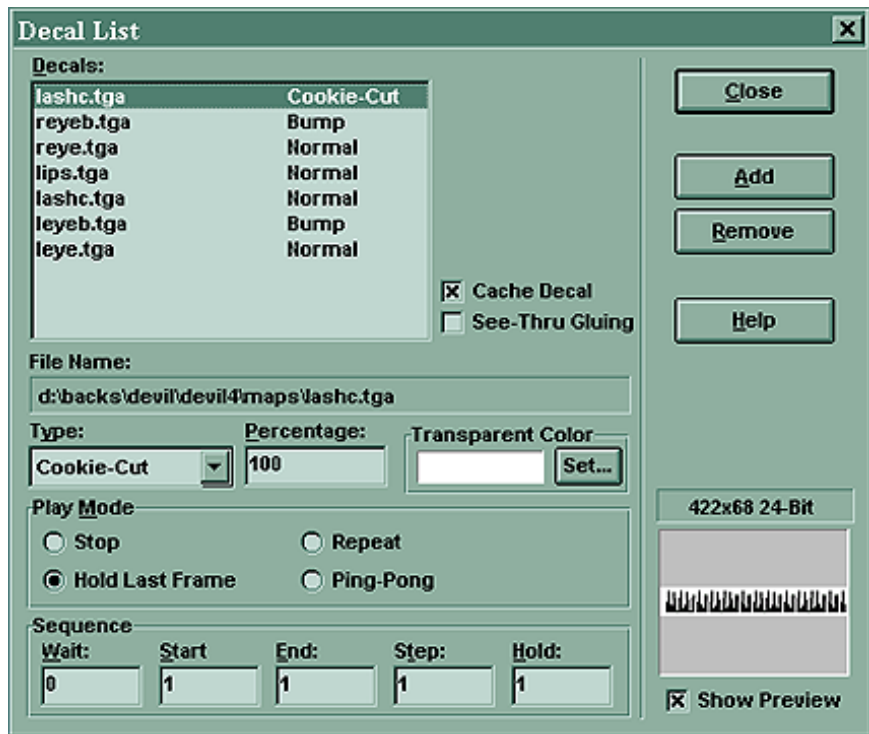


Figure 13



Figure 13a

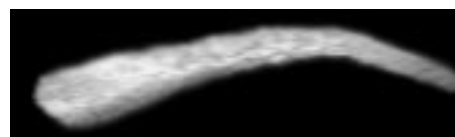


Figure 13b

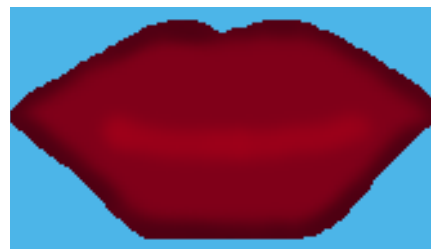


Figure 13c

The eyelashes were the most difficult for me. I wanted the effect of real lashes. So I first added more skin on the eye lid for the decal of the eye lashes (Figure 14). Then I screen captured the segment and brought it into Photoshop. I basically used 2 colors, black and white. The white would eventually be our cookie cut color. By using the cookie cut mode, we can actually make individual eyelashes. Be careful with anti-aliasing in Photoshop. It may leave some gray pixels around the edges of your lashes. That's why it better to make the decals pretty big and don't use anti-aliasing. This way, the resolution will be pretty high without those pixels.



Figure 14

The skin was done with projection maps using a Kai's Power Tools texture. The hair was made by decaling blue and black streaks onto rectangular segments and then manipulating the segments to form hair segments. This way, we can move the hair strands to any direction we want. The eye decals were also done in Photoshop using Kai's Power Tools.

When you actually go to render, the model in Direction may look a bit different than it did in character. If so, it is because the camera's focal length is off. To match it, raise the focal length to 150 or so.

WHEW! Now your model is done!



At this point, you should think about how many control points you want for the eyes and mouth, but for the face, we have yet to see, so don't worry too much about how many control points you have for the face as long as they are symmetrical. It may help to use a scanned image as a template to get things proportional, but it is not import now.