

# Blender + Zbrush

## Character Creation Series

### Part Three: Texturing



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# Part Three Texturing

## Forward

In the third part of this tutorial series you will make use of the Zbrush feature called PolyPaint. Techniques will be discussed for proper skin texturing and clothing texturing. We'll also discuss exporting this model out of Blender while keeping the detail levels high without the insane polycounts Zbrush uses.

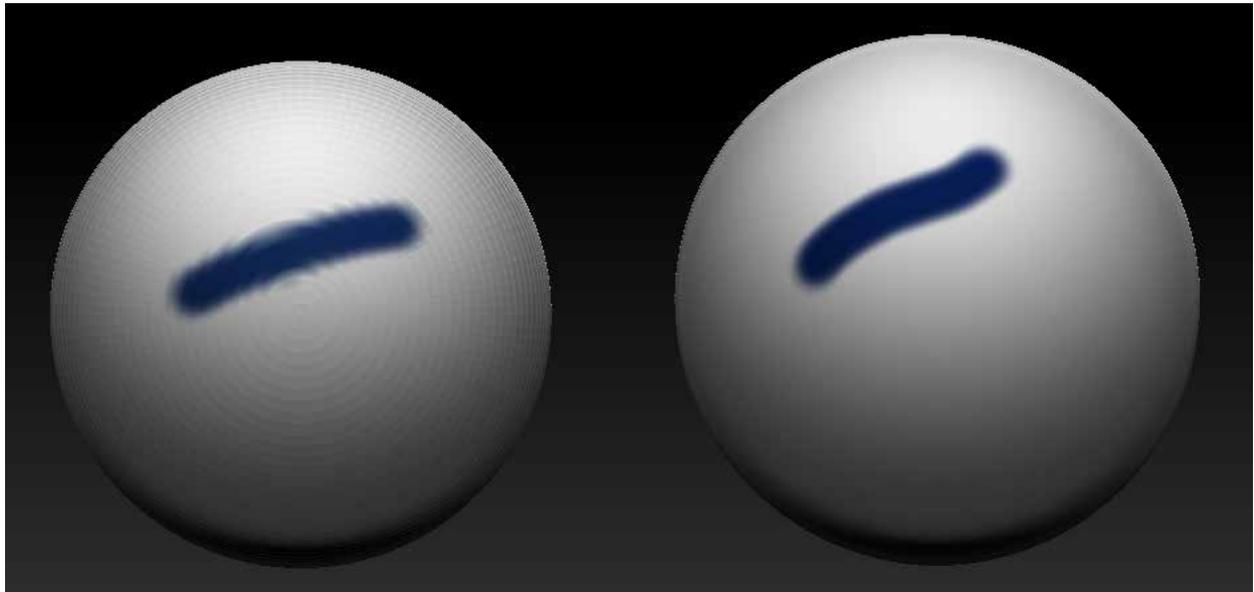


# PolyPaint Overview

What is PolyPaint?

PolyPainting is a way of adding color, or texture to your model. When using PolyPaint, you are literally painting the individual polys of your model, just like when sculpting you are moving the individual polys.

Just like in sculpting, the higher the division levels, or the higher the polycount, the better the result will be when PolyPainting in Zbrush.



The sphere on the left as only 1 division level, while the sphere on the right has 5 division levels. You can clearly see how much smoother the PolyPaint is on the right.

# Painting Skin

If you click on any color in Zbrush you will notice that the entire model changes to that color.

This is good for finding a good base color to start painting on. You don't want to just select a skin tone and apply it your model. To create an interesting surface you will want to gradually build up color, just like when we sculpted the model and we gradually built up the shape.



For an organic model I start off with a type of red base color. I will paint veins and skin in layers over top of the red, which simulates the color of blood, or flesh.

- 1. Find a good base color to paint off of.**
- 2. On the top menu of the screen click “Color” then “FillObject” to fill the model with the base color. You can change the base color at anytime by doing this again. Keep in mind, any other painting you do will be covered up by Filling the Object again.**
- 3. Select a different color. Notice the model doesn't change color this time.**

# Painting Skin Continued

When painting over the base color you don't want to use 100% color intensity, because you are slowly building up a level of color. Painting in this way insures variation in color, because skin is not one color. Technically, skin is made up of multiple thin see through layers. When painting skin you try to simulate those layers.

**4. Select and highlight RGB from the top Color Intensity Menu.**



Now you can paint individual polys.

**5. Change the Rgb Intensity to something lower, like 15-20%. Play around with values to find an intensity you like.**

**6. To add a bit of variation in color change the Stroke type to either “Spray” or “Color Spray.” It is a bit messier, and sprays a small variation in color.**

**7. Selecting an Alpha, such as Alpha 22, or 24 is a great way of building up a mass of color with great variation for skin color.**

**8. The Stroke Tool, “DragRect,” is a great way to keep the shape of the Alpha intact while you drag the shape onto the model. This is great for building up a web-like surface of veins to lightly paint over with skin color and break up the surface.**



# Masking Paint



**2. CTRL + Click anywhere off the model to invert the mask, as shown in the picture to the right.**

Also, ALT + CTRL + Click will erase masking, just in case you make a mistake while drawing your mask on the model.



Using a mask is a great way to section off an area to paint, or sculpt, without modifying other areas.

**1. Hold CTRL + Click to mask out a section of the model.**

You cannot paint or sculpt in the area that is masked. It's a pain to mask every area you don't want to paint on, so we'll invert it.



Now you can paint within the limits of the mask, which is how I made the war paint for the model, as shown in the picture below.

**3. CTRL + Drag anywhere off the model to clear the mask when you are done.**

# Spotlight Painting



Spotlight is a great way to paint using textures in Zbrush. Using Spotlight you can load photographs into the program and selectively apply them straight to the model. You can even edit the photographs in spotlight to suite your needs. Using a photograph as a texture is a great way to make your model look more convincingly real.

**1. Under Texture at the top of the screen, select Import.**

**2. Choose any photograph/texture you like.**

Do not use other people's photography unless you have permission.

I used Spotlight to texture the character's clothing, so I used a photo of some cloth.

**3. In the texture menu click "Add to Spotlight."**

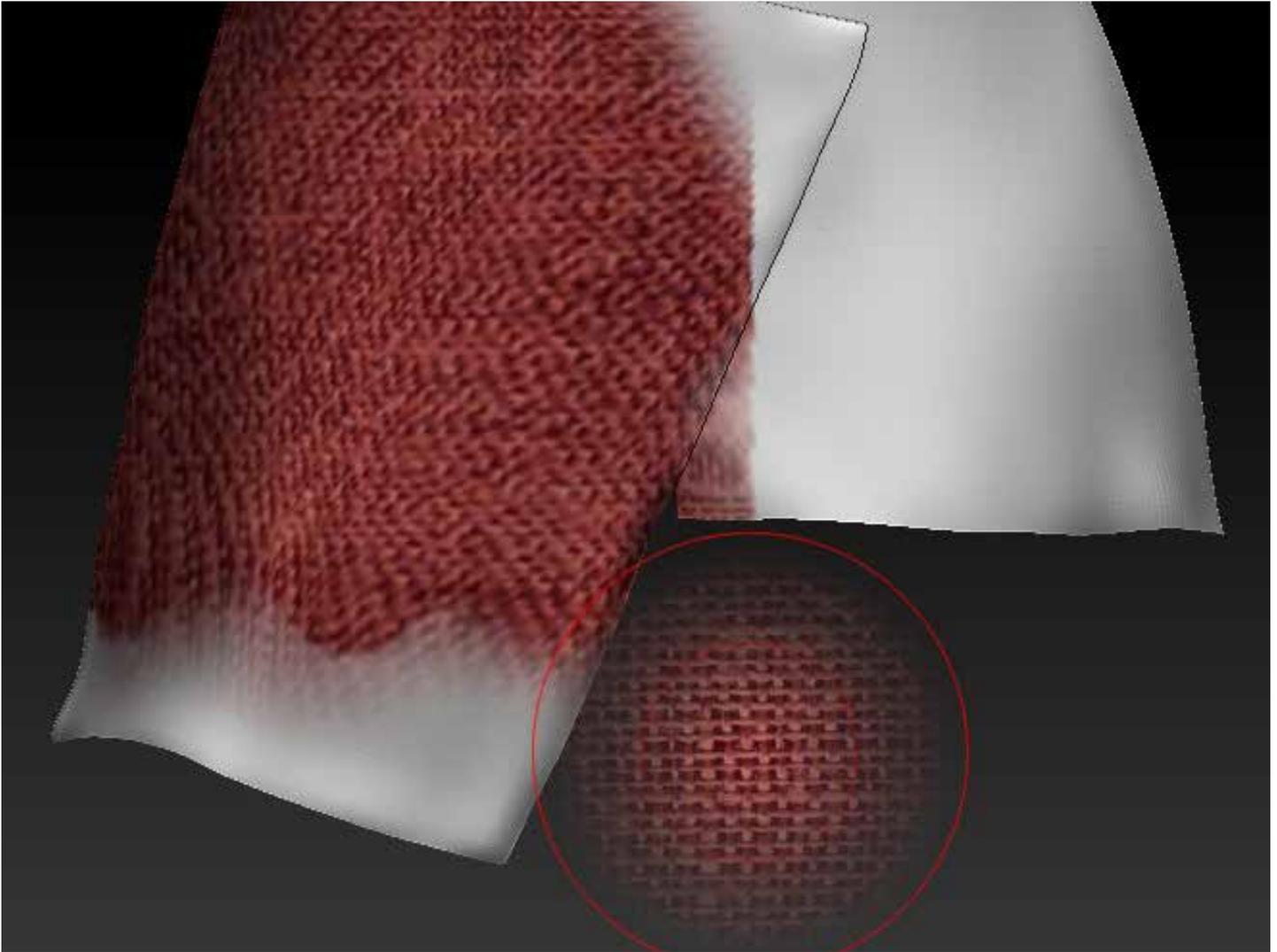
**4. Spotlight will load up and your texture will fill the screen. Browse around the Spotlight ring to select various options, such as the scale, saturation, intensity, etc. Click on an option and drag the circle to change the settings.**

**5. When you are ready to paint with the texture adjust the spotlight radius and Press "Z." Then you can paint with the texture. To reload the wheel press "Z" again. To close Spotlight, press Shift + "Z."**

You can load many images into Spotlight, edit them, and use them as textures.



# Spotlight Continued



In this image I am using an edited photograph supplied with Zbrush called “hessian01” in spotlight to simulate cloth for the clothing of the character. Spotlight is allowing me to paint the edited texture directly onto the model. You can see the radius of the photo within the red circle, showing what part of the texture I am applying to the model.

# UV Mapping Explained

A UV Map is the assignment of polygons to an image. Every face of the model is assigned a certain spot on the image, and that spot on the image is projected on the model. You have already painted the model so it's time to turn it into a UV Texture Map. We'll need to do this to export the model out of Zbrush and get the Polypainting to show up in Blender as a texture map. Keep in mind that Blender cannot handle millions of polys like Zbrush. That's why we need UV and Texture Maps, to retain the detail information.

To do that we'll have to unwrap the model. What this means is essentially flattening the model out. The texture is assigned to UV Coordinates on a flat image.



As you can see to the left here, our model is fully textured and “flattened” out. You can see the outlines of all the faces and where they are, flattened out, on the image. This is called a texture map, and you can see the UV Map right here.

Before Zbrush a character artist had to manually UV Unwrap a character on their own. This was tiring and painstaking. Fortunately, for us, Zbrush will automatically create UV Maps and with a little tweaking we can get a lot out of this system. This is great for getting your model ready to export.

# UV Master Plugin



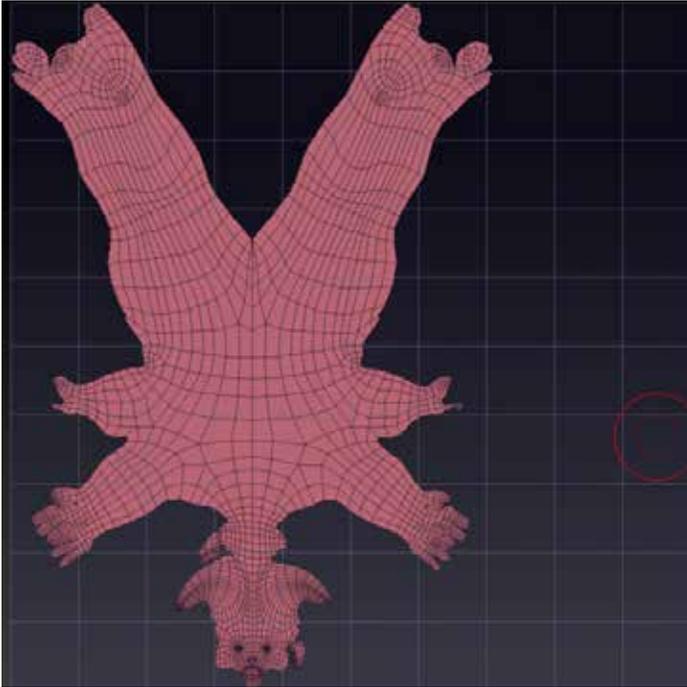
First you need to decide what division level you will want to export back to Blender. This depends on the polycount you want to render. The second division level of my model was about 12,000 polys. The first level was about 3,000 polys. I went with the second level because of the higher polycount. This is the amount of polys the model we export will have, and will look better than a 3,000 poly model. Anything higher than that is a waste of system resources. You can experiment to find out how many polys you think is right to render for your model, however.

- 1. Lower the division levels to where the polys are around 10,000.**
- 2. Go to the top of the screen, click Zplugin, and then click UV Master.**
- 3. UV Master cannot work on a model with multiple division levels. Click “Work On Clone.” This creates an exact copy of the model, without division levels.**
- 4. If you click “Unwrap” now, Zbrush will unwrap the model. Click “Flatten” to view the UV Map. “Unflatten” returns you to the model.**

This result leaves a lot of space on the texture map untouched, which is basically a waste of image data. It's better to divide up the model into different sections which allows each section to take up more space.

- 5. Mask off the feet, hands and head of the model. These will be the separate groups we make on the UV Map.**

# UV Master Continued



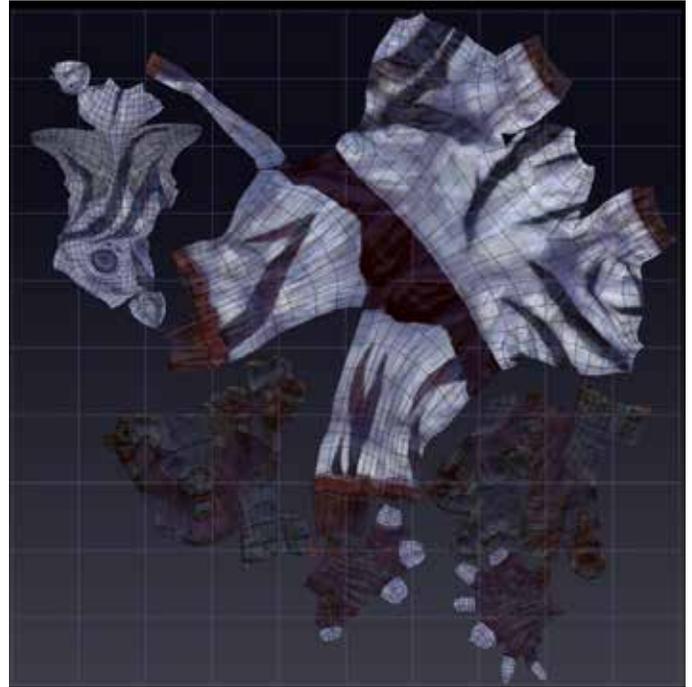
On the top left, an unaltered UV Map. Notice all of the wasted space on the page, compared to the image on the right, an altered UV Map separated into groups that uses more of the page.

**6. Click on the Polygroups menu on the right.**

**7. Choose “Group Masked.”**

**8. Highlight “Polygroups” and un-highlight “Symmetry” under the UV Master menu.**

**9. Unwrap the model again.**



**10. Flatten and view the new UV Maps. Unflatten and return to the model.**

The next step is getting these UV Maps onto the real model that has the detail information, and not just on the clone.

**11. On the UV Master menu, click “Copy UVs.”**

**12. Return to the original model, and click “Paste UVs.” The original model now has the same UV Maps.**

# Exporting Maps

Since Blender uses much lower polycounts we'll use image maps to fake the details of a model with millions of polys. We are going to export three different types of image maps for use in Blender. The maps include a texture map, normal map, and finally a displacement map.

A texture map holds all of your color data. A normal map effects the way light falls on the surface of a model, which fake the shadows of little details like skin pores. A displacement map literally effects the placement of your polys by morphing, or displacing them into a different shape, faking the appearance of a model with millions of polys.



The model on the left is about 12,000 polys with texture, normal, and displacement maps (in Zbrush) The model on the right is about 12,000,000 polys without the maps. As you can see, it is possible to get the performance benefits of a low poly model with the details of a high poly model by using different maps.

# Exporting Maps Continued

When exporting maps the bigger the image the more detail and information it can hold, sort of like how a high definition film looks better than a low resolution film. The higher the resolution of the map means more detail for your character, at the cost of system ram. For a character like this where you want details to be crisp and well defined, a texture resolution of 4096X4096 px works well. If your system is not as powerful you can use a texture resolution of 2048X2048 px. Resolutions like this are only for rendering, not for gaming.



1. Under the UV Map menu on the far right, click 4096. This will set the exported texture size to 4096X4096 px.

2. Change the model's division levels to the highest level. This is the highest level of detail of the polypaint.

3. Under the Texture Map menu click "Create." More options will appear.

4. Clearly we want to

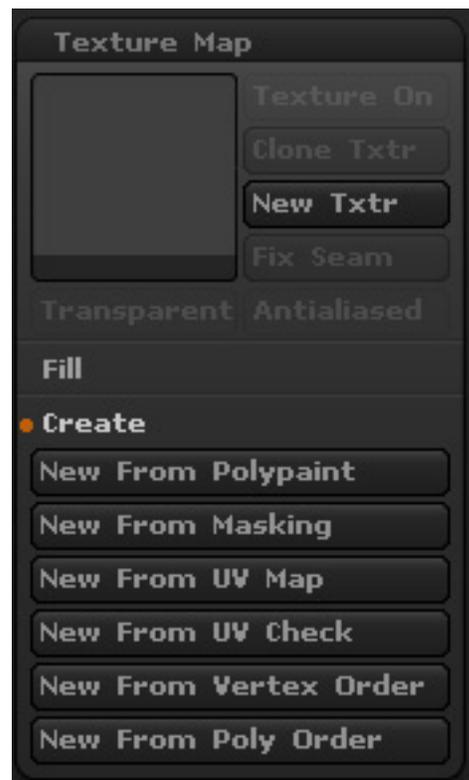
create our Texture Map from the Polypaint, so select "New From Polypaint."

You'll see the map appear in the little square window.

5. Click "Clone Txtr." This will send a copy of the texture map to the Texture Menu at the top of the screen.

6. Select the new Texture Map from the Texture Menu, and select "Flip Vertically." This is because maps are flipped in Blender, so we need to flip them before we export them.

7. Finally, click "Export." Name it something like "Character\_texture.jpg" or .bmp. Blender reads either format. Click "ok." The Texture Map is now saved. Jpg files are much lower in filesize, because it is a lossy format.



# Exporting Maps Continued



To export Displacement and Normal Maps:

1. Lower the Division Levels to 1. When creating detail maps like this, you are basically saying that you want the highest level of detail applied to the lowest level of detail.
2. Find the Displacement Map menu. Click “Create DispMap.” The map will appear in the square.
3. Click “Clone Disp.” The map, since it is a Non-RGB file will be sent to the Alpha Palette on the left side of the screen.
4. Select the map from the Alpha Palette. Click on “Make Tx.”
5. Under the Texture Menu at the top of the screen, flip the Displacement Map vertically, and Export it. Name it Character\_disp.jpg or .bmp.
6. Find the Normal Map menu. Uncheck “SmoothUV.” Click “Create NormalMap.”
7. Once created, click “Clone NM.”
8. Under the Texture Menu at the top of the screen, find the normal map, flip it vertically and then export it as Character\_nor.jpg or .bmp.

# Exporting The Model



Finally we will export the model out of Zbrush as an OBJ so it can be imported back into Blender. Remember to get UV Maps for all of your subtools as well, and export the texture, displacement and normal maps for them.

**1. Lower the Division Level to the level that you made the clone earlier.**

**2. Click “Export” on the Tool Menu.**

The model is now exported as an OBJ file, and has UV Maps.

Before we continue you may want to create other assets, such as weaponry, teeth, eyes, etc. Follow the same steps as before. All models can be made starting with a basemesh, exporting out to Zbrush, sculpting and texturing, uvmapping, and exporting back to Blender.

# Video Companion

When it comes to art, some things are better off being visual rather than being written about in a guide. If you are having trouble with some of these techniques I have supplied a video to re-irritate the focus of this tutorial. Check it out right here:  
<https://www.youtube.com/watch?v=lwngjDrirdA>



# To be Continued...

That's all for Part Three! By now you should have the knowledge to Polypaint, UV Unwrap and export maps from Zbrush. In Part Four of this series we will look at how to bring the model back into Blender and set it up using the Cycles Rendering Engine!



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