Body to Blender Guide

Wednesday, September 18, 2019 3:06 PM

Wogrim's Epic Body to Blender Guide

Why?
To have a KK body in Blender for use
To show how to implement many of KK's shader features in Blender, like color masks and detail masks, which can be applied to pretty much any item category
To improve the efficiency of mod creation by not having to rebuild a mod to test minor changes in-game

Things We Will Not Do
Before we get started, I'll list the things we aren't going to do here:

- KK's lighting model: KK does shadows in a custom way that saturates the color, in addition to darkening it, which I don't think we can reproduce in Blender
- Outline: outlines need shader capabilities I don't think you can do with Blender nodes
- Rim Lighting: I don't think we can do this with Blender nodes
- KK style highlights: we won't have the saturated color around the skin glow, or the moving skin glow
- Nipple size: in game they do something for scaling the nipple texture which I do not care about
- Liquid: can be done but it's a lot of calculations, and not much benefit. You can texture paint a liquid mask without implementing liquid, but if your item's UVs require a custom liquid spray pattern the normals will suck
- Body Mask: I don't have time to look into these right now, but should be pretty easy to implement, just have to figure out the logic for the transparency

You Will Need
KK installed
SB3UGS (for exporting game files)
Blender (I'm using 2.80)
GIMP (possibly, to save images in a different format)
Material Editor (possibly, SB3UGS sometimes doesn't give me a file I can read)

Open Body Game CAB File in SB3UGS
abdata\chara\oo_base.unity3d
You can probably do this with the body in an uncensor mod, but I can't make promises

Rescale Nipple Bones
If you don't do this the area around the nipples will be flat
Open the animator called p_cf_body_00
Expand All on the object tree, and find these nipple bones
cf_s_bnip025_L and cf_s_bnip025_R
Change the scale on them to 1,1,1, and hit Apply Changes with Update Bones checkbox checked

Export Mesh
On the Mesh tab of p_cf_body_00, select o_body_a
Export with the default options
This will create folder structure at location of the .unity3d file with mesh inside

Export Related Textures
We want the body to look good in Blender, so we export additional textures. Some may have been

exported automatically with the body.
Even if you don't care, it is good to know the workflow so you can do the equivalent for other items.
If you have any issues with the file format that SB3UGS puts out, you can get some of these with Material Editor.
Main Texture (not really necessary when it's just white, but good practice)
    cf_body_00_t
Color Mask (for choosing skin, skin red, and fingernail color)
    cf_body_00_mc
Normal Map (to make the body look smoother and to give body type)
    pick one from mt_body_detail_00.unity3d or a mod
Line Mask (to give body type)
    pick one from mt_body_detail_00.unity3d or a mod, to go with the normal map
Detail Mask (for some shading)
    cf_body_00_md
Nipples
    pick one from mt_nip_00.unity3d or a mod
Pubic Hair
    pick one from mt_underhair_00.unity3d or a mod

Import Mesh in Blender
Delete the cube and the camera, but leave the light
Set the light Properties as a "sun" type with a strength of 2
Set World Properties (ambient light) to be a color of around (hex) DADADA, based on preference
File -> Import -> FBX
It should show up in the Outliner but may be too small to see in 3D view
Click the eye next to "Armature" to hide the bones, expand Armature so you can see the components

Zoom In
Easiest way is the zoom to selected hotkey, which is by default the period on the numpad
You may have trouble seeing it because of clipping distance of the viewport
The fix is in the view tab on the 3D view's sidebar (which may be hidden) and type in 0 for clip start

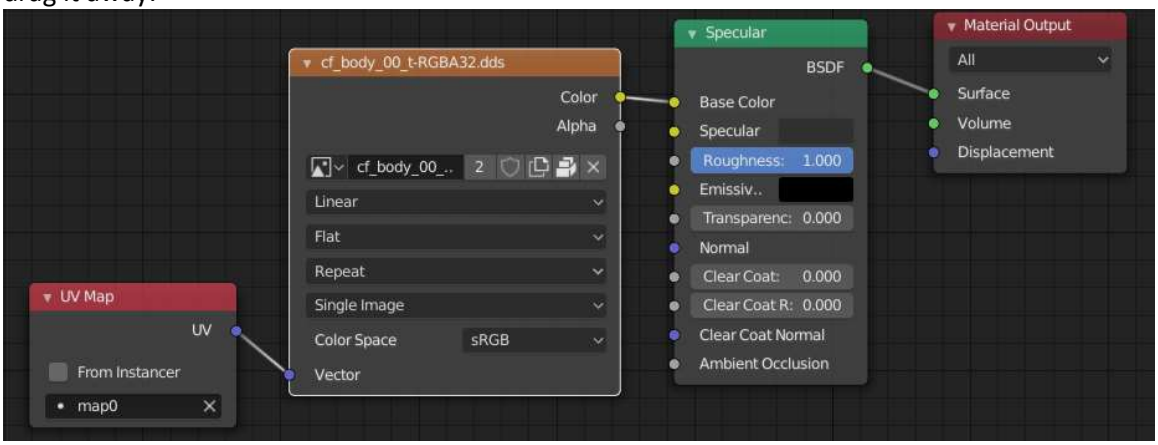
Add Textures
Open an Image Editor window or switch to a workspace that has one, put it in View mode
Open each image you want to use and go to Image -> Pack so that a copy is saved in your Blender file.
Blender doesn't seem to like some formats, so you may have to convert some of them.

Set Up Material
In the Properties window, make sure the Render Engine is set to Eevee
Select the mesh in the Outliner window, and find the Material tab in the Properties window
Make sure the surface section has "Use Nodes" highlighted
Open a Shader Editor window or switch to a workspace that has one, and 3D view (set to Rendered mode)
It should show your body's material and the Use Nodes box should be checked
Delete ALL the nodes. Your rendered 3D view should look different now.

Basic Node Setup
So the way the nodes work is when blender needs to render a pixel, the shader on the object's material determines what color it should be. This can be super simple (just main texture), or it can be several textures and a bunch of calculations. Since we're trying to do several of the things the in-game shader does (I don't think it's possible to do everything, and some are not worth the effort), it's going to be complicated. But we'll do it one piece at a time.
Add these nodes:

UV Map (Input)
set to map0
Image Texture (Texture)
set to the body's main texture
Specular (Shader)
Material Output (Output)

Connect the dots and you should be able to see your body become a light gray, affected by the light angle. If you make a connection you don't want, hold control and drag left click on a connection point to drag it away.

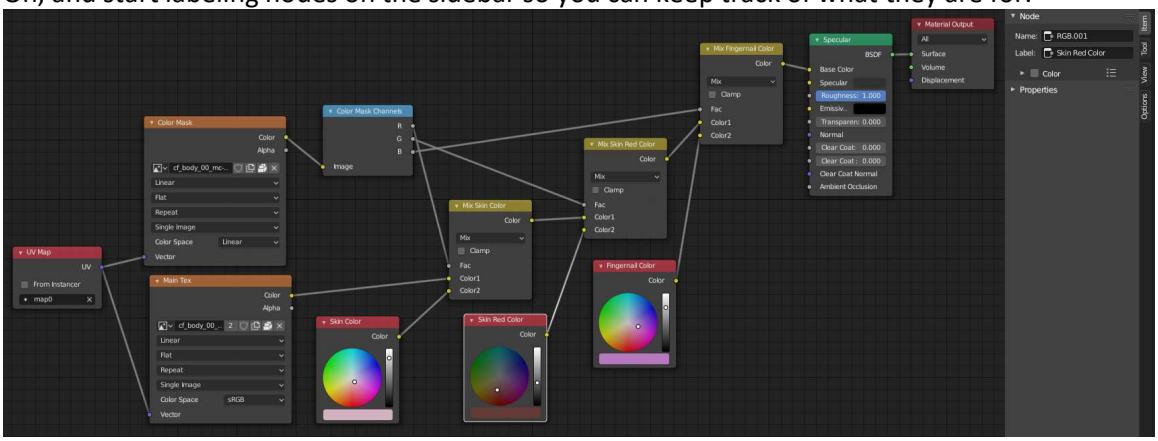


Adding Skin Color

So, if we want to use the color mask and set skin color, we've got to add a bunch of stuff. Spread those nodes out so we can add these:

Image Texture
set to the color mask
set color space to linear
RGB (Input)
3 of these, which will be our color pickers for skin, skin red, and fingernail color
Separate RGB (Converter)
this separates the channels of our color mask
MixRGB (Color)
3 of these, which will mix the color picker colors with the main texture

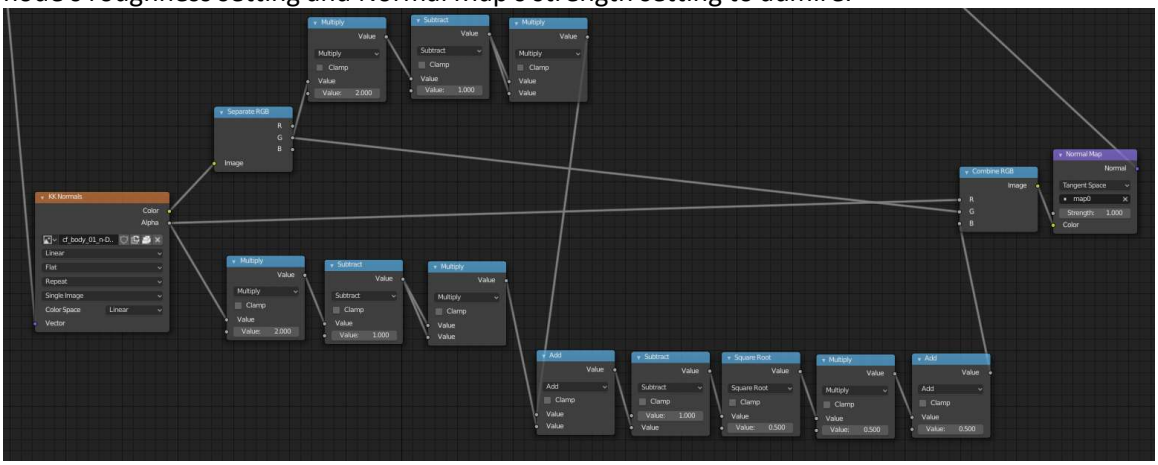
Connect them as shown in this picture. This is how I think the in-game shaders mix the colors, after some studies on my own custom colormask items. You'll notice the skin red color is not a very strong effect. This is because the way KK does shadowing is what gives the normal skin most of its redness. Oh, and start labeling nodes on the sidebar so you can keep track of what they are for.



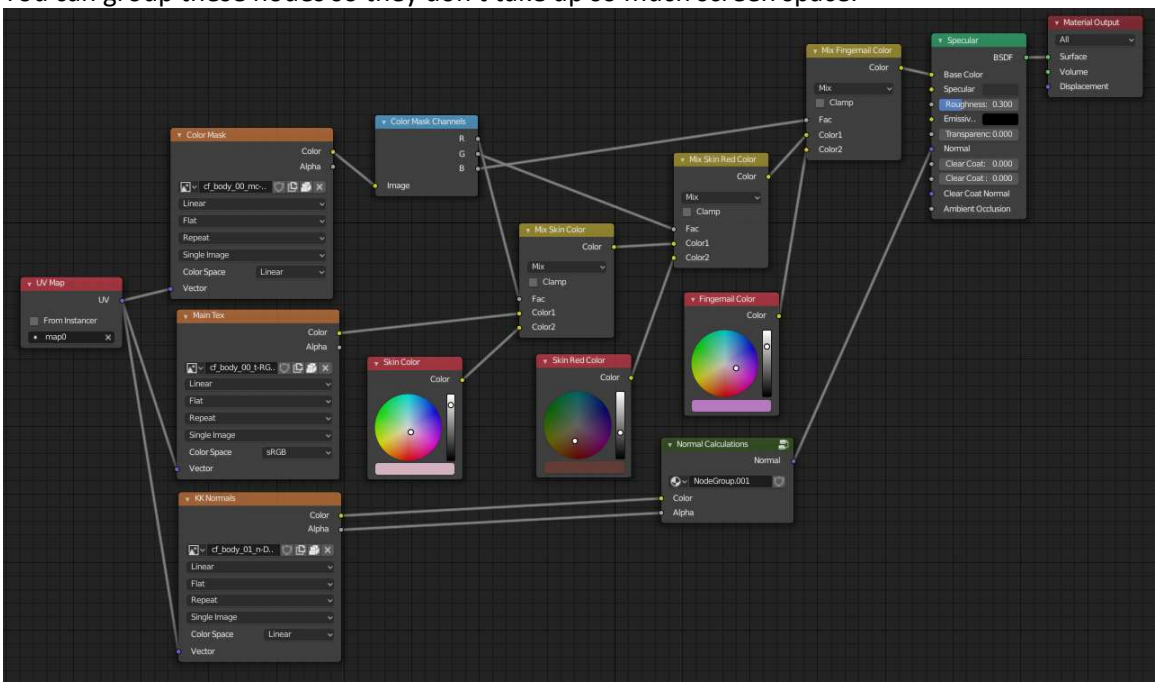
Adding Normal Map

For a regular, blue-style normal map, you would put the texture as "Non-Color" and just send it to a

Normal Map (Vector) node, but KK style we have to do some calculations. Alpha becomes Red, Green (or any color because it's grayscale) becomes Green, and we have to calculate the blue portion of the normal map. At the end of the day it's a big mess. If the light appears to be coming at your model from the wrong angle, you messed something up. When you've got it working right, play with the Specular node's roughness setting and Normal Map's strength setting to admire.



You can group these nodes so they don't take up so much screen space.



<u>Adding Pubic Hair and Nipples</u>

So how do we add some of those juicy details? Let's start with the pubic hair. The shader knows where to put the pubic hair on the model because there is a separate UV map for that area of the body. So you'll need to add some more nodes:

UV Map

map2 is for pubic hair, you can try the other ones to see where they are

Image Texture

the pubic hair texture of course, linear color space

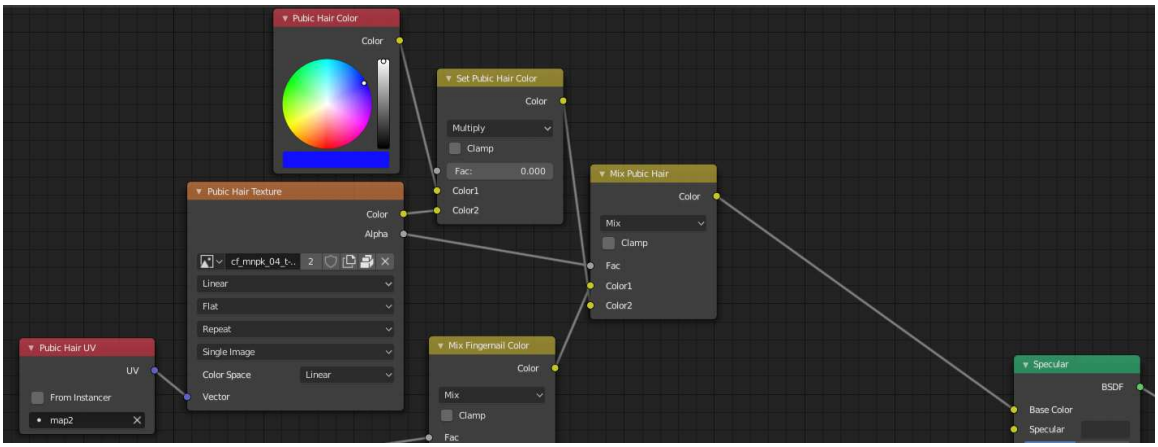
RGB

the color picker for the pubic hair

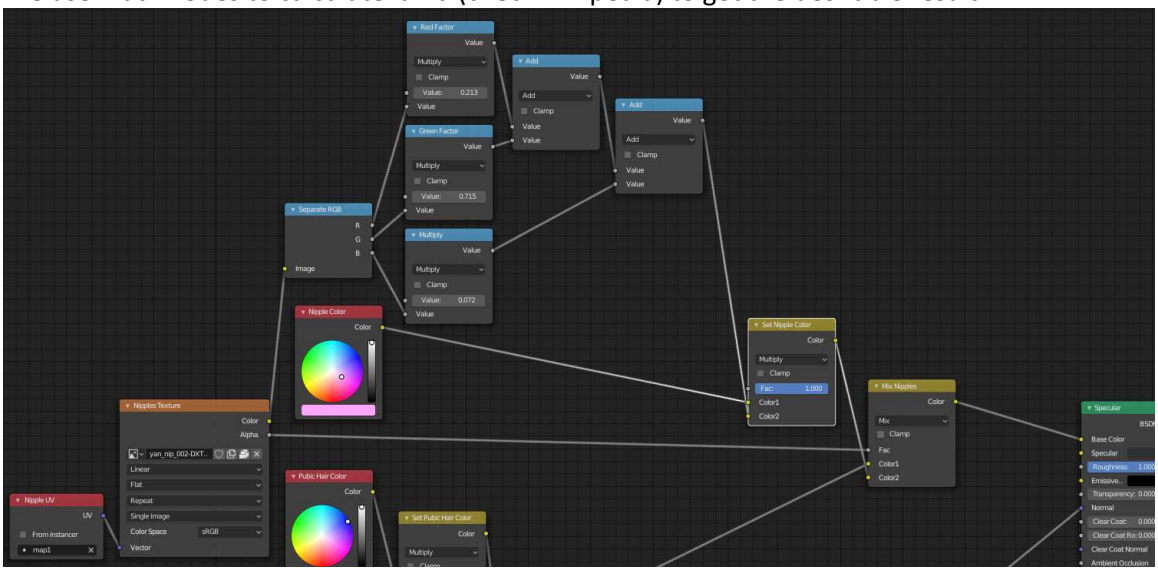
MixRGB

one for mixing the pubic hair color with the pubic hair texture, set to multiply

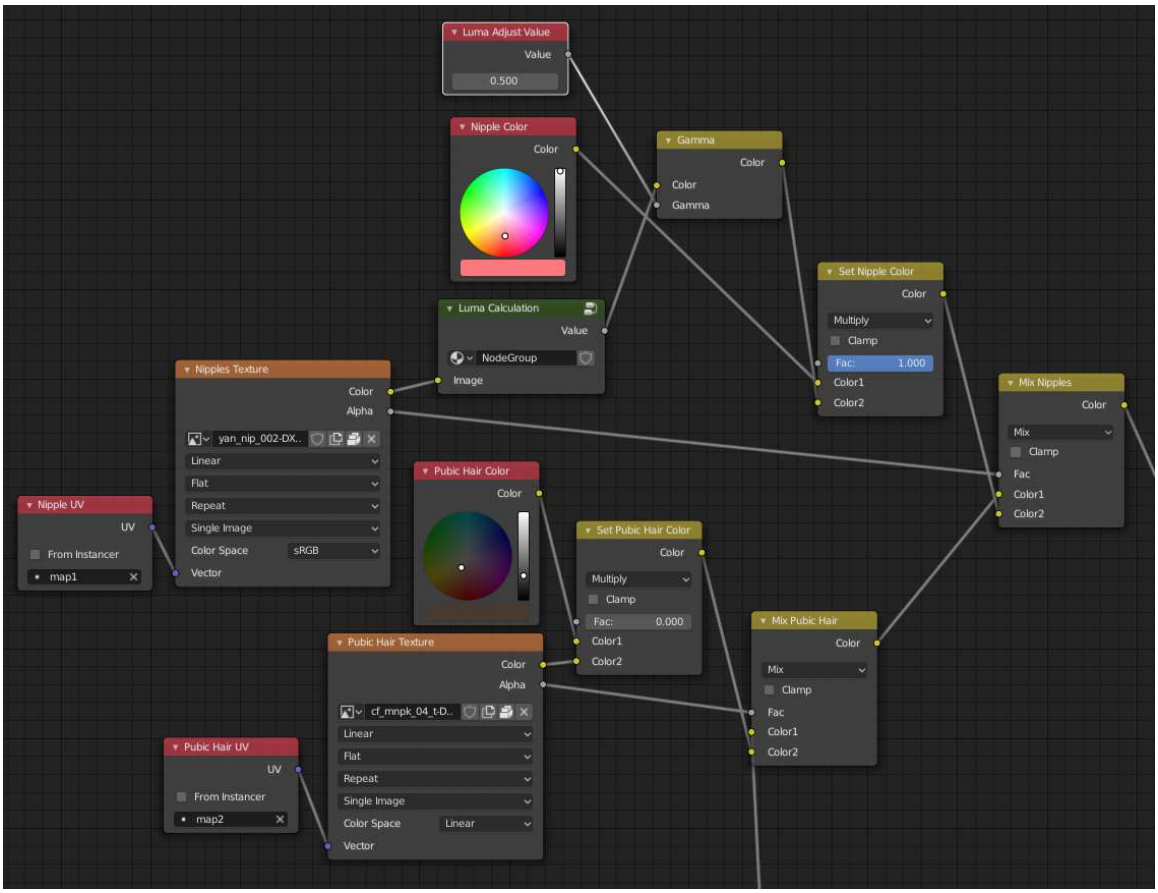
one for mixing the pubic hair with the body color



Color picking for the pubic hair is really easy because the pubic hair textures are white. The nipple textures are colored though, so we can't mix the texture in the same way with the color picker. We basically want to convert the nipple texture to black and white, but just removing the saturation from the nipple texture doesn't work because the eye perceives green to be much lighter than red and blue. We use math nodes to calculate luma (check wikipedia) to get the desirable result.



It is a little messy, but we can hide the calculation in a node group. I decided to add in a Gamma (Color) node to adjust the calculated luma, which basically brightens it so that we can get our nipples closer to the color of the color picker.



Line Mask

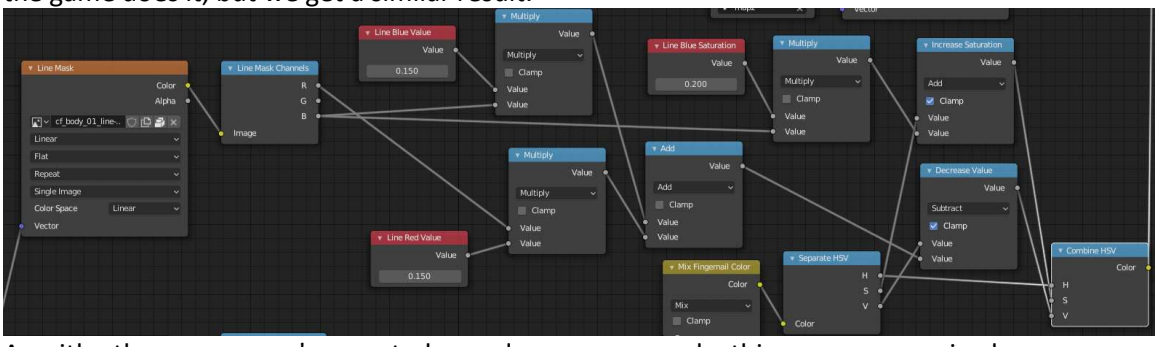
We'll do Line Mask next because it's important for showing off the body type. From what I've seen, here's what each color does:

Red darkens a bit and increases saturation slightly but I'll ignore the saturation

Green darkens based on the game's outline settings, we will ignore it because no outline

Blue darkens a bit and greatly increases saturation

So we're going to approximate these effects by separating HSV and modifying them. We will do these calculations after the skin color mixing but before the pubic hair and nipples. This may not be quite how the game does it, but we get a similar result.



As with other messes we've created, a node group can make things more organized.

Detail Mask

The last thing we're doing is the Detail Mask

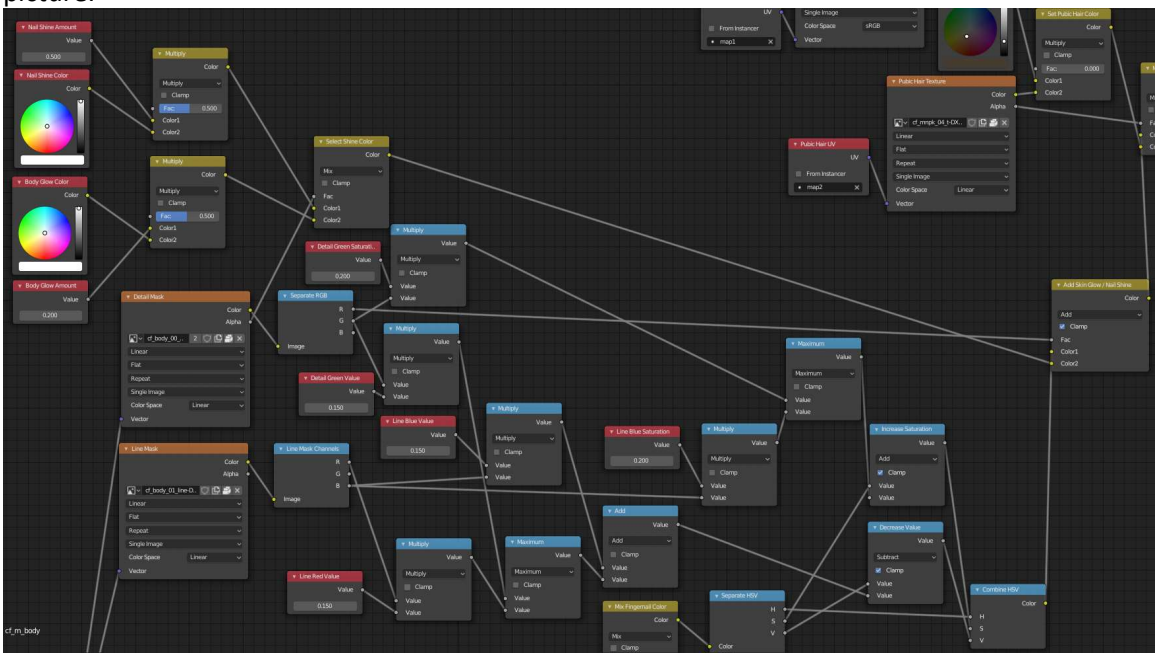
Red is for the "skin glow"

Red + transparency (lack of Alpha) is nail shine

Green is like blue on line mask but scales with shadow settings instead of body type strength, and they do not combine (maximum is used)

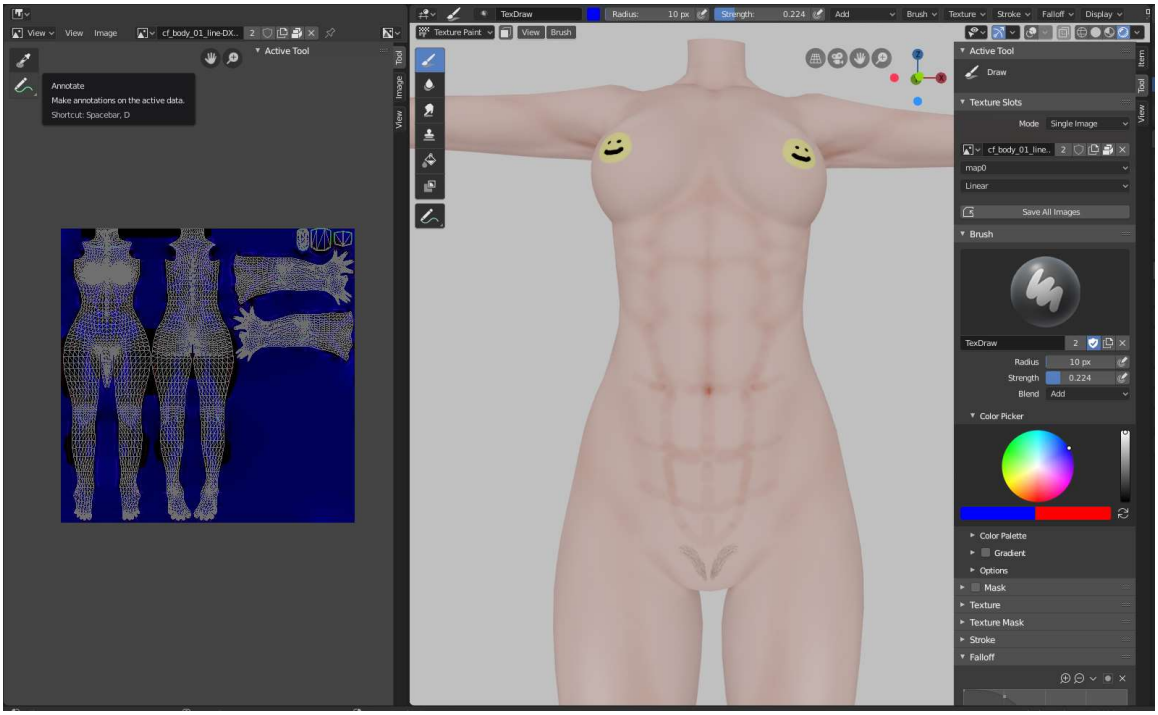
Blue doesn't seem to do anything on the body

Skin glow and nail shine are just white, apart from the outer skin glow that we can't reproduce, but we'll make them selectable colors anyways. But they have their own sliders in game so we will separate them and determine which to use based on alpha. The green we will just put in with the calculations for line mask blue and use whichever is bigger. These things combined with the line mask stuff will look like this picture.



What Next?

- Tweak whatever settings you wish or even the way things are calculated if you want to get more accurate results (the big thing I don't think you can fix is shadows, so you might want to basically turn them off by turning off the directional light and turning up the ambient light)
- Adapt this for Head, Hair, Clothes, Accessories, and Studio Items. You can copy-paste nodes from one material to another so you don't have to remake it from scratch. Keep a "master copy" of each type backed up so you can copy it over each time you're working on a new item.
- Texture Paint. I'm sure there's good YouTube videos of how to do this, but basically you're painting right on the 3D model and it goes to whichever file you want. So you can texture paint a main texture, a color mask, a detail mask, a line mask, a liquid mask, a body mask, pubes, nipples, ANYTHING. You can be as crude or as detailed as you want (as long as your texture resolution is high enough). Here's an example of texture-painted pube, nipple, and line mask (blue) modifications. I set the brush to "add" so it only affected the blue channel.


View
View
Image
cf_body_01_line-DX..
Active Tool
Annotate
Make annotations on the active data.
Shortcut: Spacebar, D
Tool
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Radius:
10 px
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Texture
Stroke
Falloff
Display
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Save All Images
Brush
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