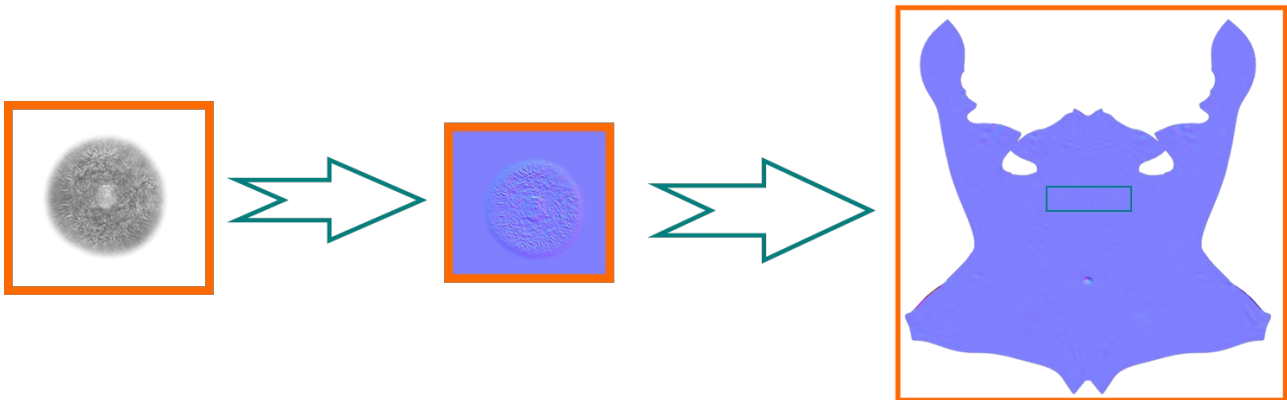# Bake DAZ Bump Maps to Normal Maps

as of 08/06/2023

This tutorial will cover the process of creating a normal map based off the bump map of [Lifelike Nipple Graft](#) and baking it onto the existing character body texture using the freeware Blender to save texture memory in Game Engines like UE 5

Rationale (aka Why should one do that?!)

Many Genesis 8 characters from the marketplace only provide the user with a bump map and no normal. Even though converter tools like the *DAZ to UE* or *DAZ to Maya* Bridge will generate a normal map, its quality is inferior to the ones provided with high fidelity character assets – which should always be the first choice. If your DAZ character doesn't come with a tailored normal map, one <u>could</u> achieve a more realistic look in game engines like Unreal by baking a normal out of the (usually always present) bump map. It has to be evaluated on a case-by-case basis whether the baked texture is superior to the auto-generated one from the DAZ Bridges.

## I. Creating the Bump Material in Blender

- Start a new Blender project and navigate to the "Shading" tab in the top toolbar
- Select the material "Material" in the top dropdown menu in the node editor and remove the "Principal BSDF" node
- With your cursor hovered in the material editor, hit spacebar and search for "Texture Coordinate"
- Drag & Drop your bump map texture into the material editor

How to find my bump map?

- *File Explorer*
  - The textures are all collected in the following folder structure on your PC: [...]DAZ 3D\Applications\Data\DAZ 3D\My DAZ 3D Library\Runtime\Textures
  - Either navigate to the folder of the author of the character or search the characters name to find the folder with all textures inside
- *DAZ Studio*
  - With your character (or GeoShell) loaded and selected in DAZ Studio, navigate to the "Surfaces" tab in the bottom right panel
  - Expand the sub-menu "Surfaces" and select "Torso"
 - Scroll down until you find the option "Base Bump" and hover over the image icon to reveal the file path
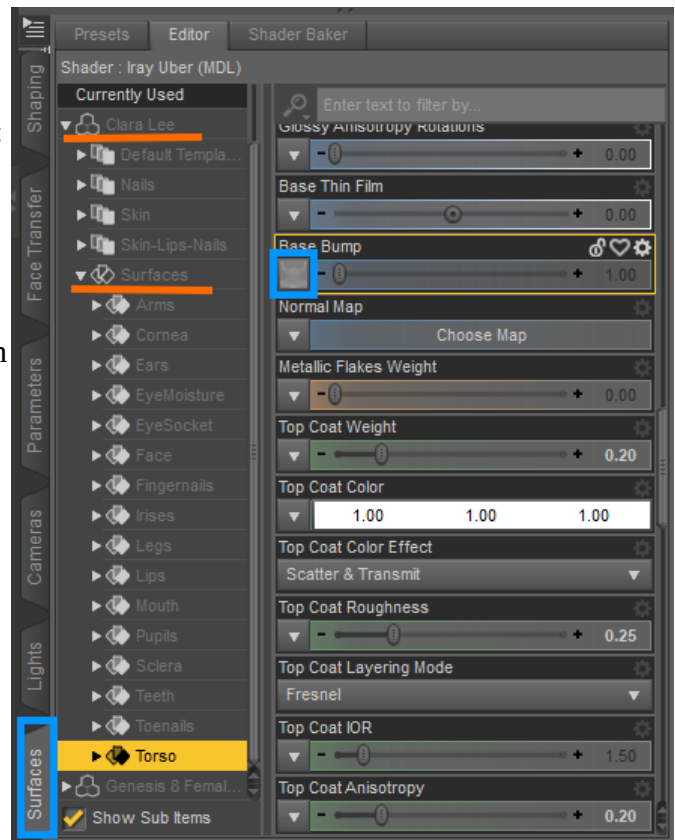
- With the new image texture node created, wire the "UV" output of your "Texture Coordinate" node into the "Vector" input
- Add a "Converter Math" node and connect its first input with the "Color" output of your bump image node
- Change the operation from "Add" to "Multiply"
  - Baking a normal map "at full strength" will result in a texture distortion wherefore we have to drastically reduce its intensity
  - As I work with an intensity of 0.33 for the torso normal map inside Unreal Engine, I multiply the bump texture by a value of "0.002"
  - Test with values by quickly baking normal maps at different intensity levels (see below), importing these into UE and examining its effects on the character under the given lighting setup
- Create a new "Bump" node (vector type, not switch) and wire the output of the "Multiply" into the "Normal" input
  - I haven't seen any visual differences by altering the values of "Strength" and "Distance", so I left them at a value of "1.0"
- Create a new "Diffuse BSDF" and connect its output to the "Surface" input of your "Material Output" node
- Wire the "Normal" output of the "Bump" node into the "Displacement" input of the "Material Output" node
- Create a new "Image Texture" node and click on "New"
  - If you intend to bake a GeoShell normal onto the torso normal map, you have to match the resolution of both maps
  - => This will be the texture that is to be baked, do not connect the node in any way
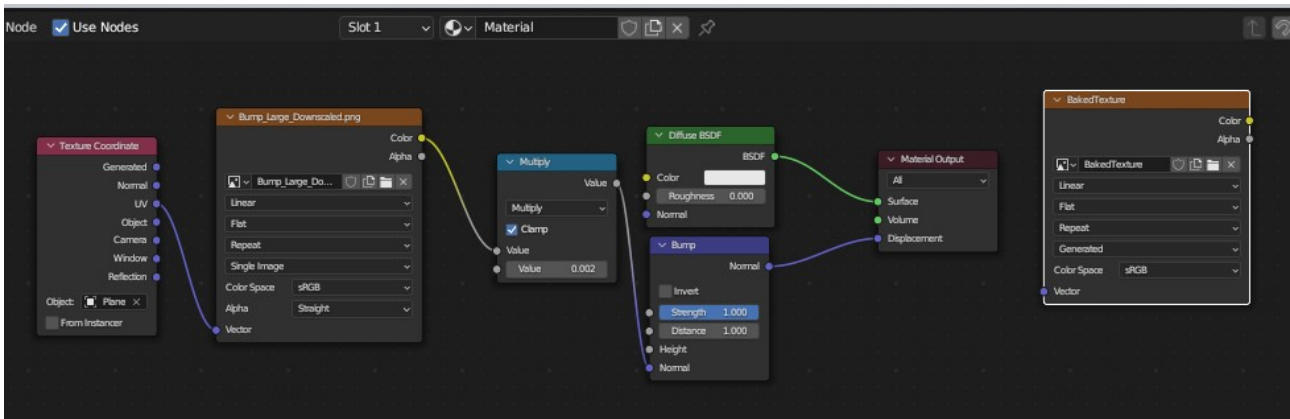
II. Baking the Normal Map

- With the newly created texture node selected (highlighted in white), switch to the "Render Settings" tab in the bottom right panel
- Render Engine = Cycles (as it is superior to Eevee)
- Device = GPU Compute (as it will be significantly faster than CPU rendering)
- Under "Sampling → Render", disable "Denoise" (it will speed up rendering drastically at the expense of details that we certainly want in a normal map)
  => The Time Limit doesn't work in Blender 3.2 or 3.6 so you can safely ignore it
  - You can set "Max Samples" to 50 in order to render quick textures to examine their effect inside UE
- In the sub-panel "Bake", select "Normal" as the "Bake Type" and set "Margin" to "2px" (as we don't need a margin, also don't want a sharp transition)
- Now hit the button "Bake" and wait patiently until the texture has been created
- Once done, navigate to the bottom left window and click on the three lines right to the "View" drop down menu
- Select "Image*" and "Save As…" and save the baked texture as a png with default settings
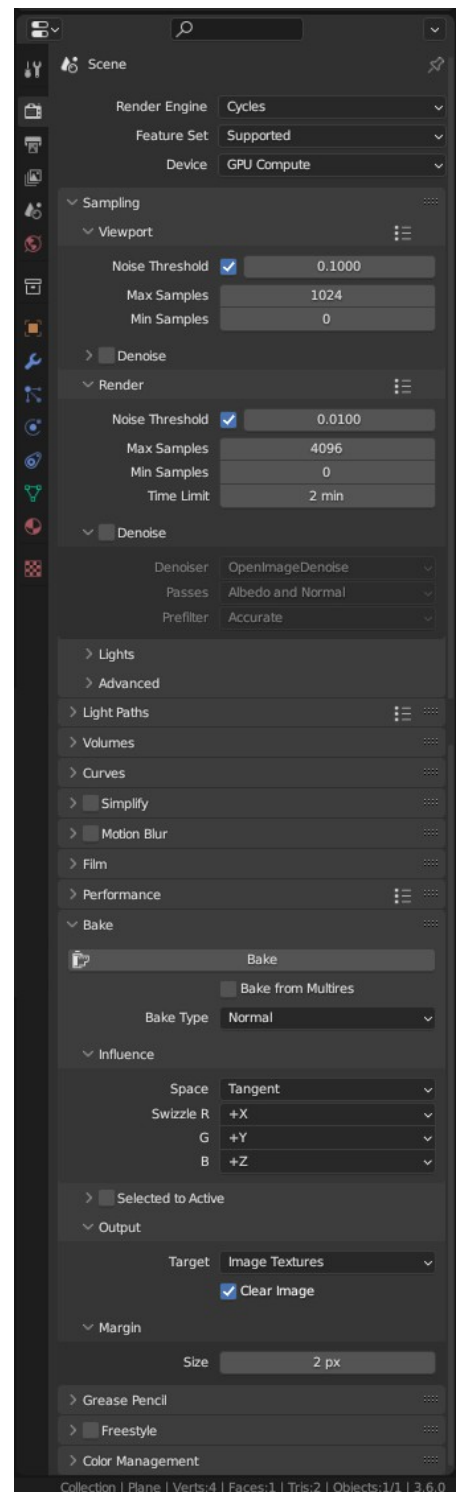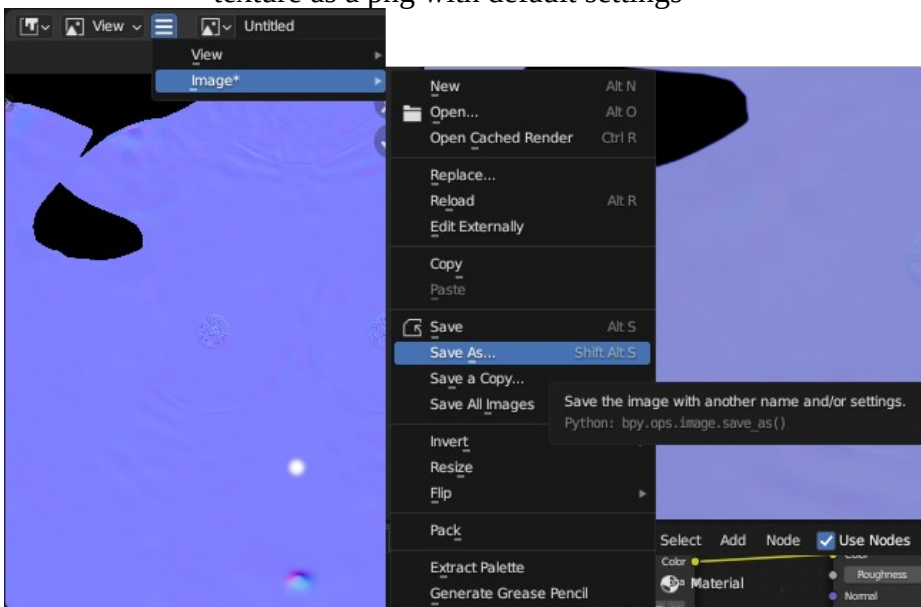
III. (Optional) Baking the GeoShell Normal onto the Body one

This only works for L.I.E. GeoShells (i.e. another texture layer is placed on top of the default skin layer). In case of a "Custom UV Overlay GeoShells", the texture has to be baked in a more laborious way as outlined in section IV.4.2 in the [DAZ Body w/ MetaHuman Head](#) tutorial.

Material Setup
- Using the same material as before, drag & drop your torso normal map into the node editor
- Add a "Diffuse BSDF" node and connect its "Color" input with the respective "Color" output of the torso texture node
- Add another "Diffuse BSDF" and connect it to the recently baked image texture node
- Add a "Mix Shader" and connect the torso normal first, then the BSDF of the baked texture
- For the "Fac" input, hook it up with the "Alpha" output of the bump texture
- Connect the output of the "Mix Shader" to the "Material Output" and disconnect the "Displacement" pin
- Create a new "Image Texture" node and set a resolution fitting your needs
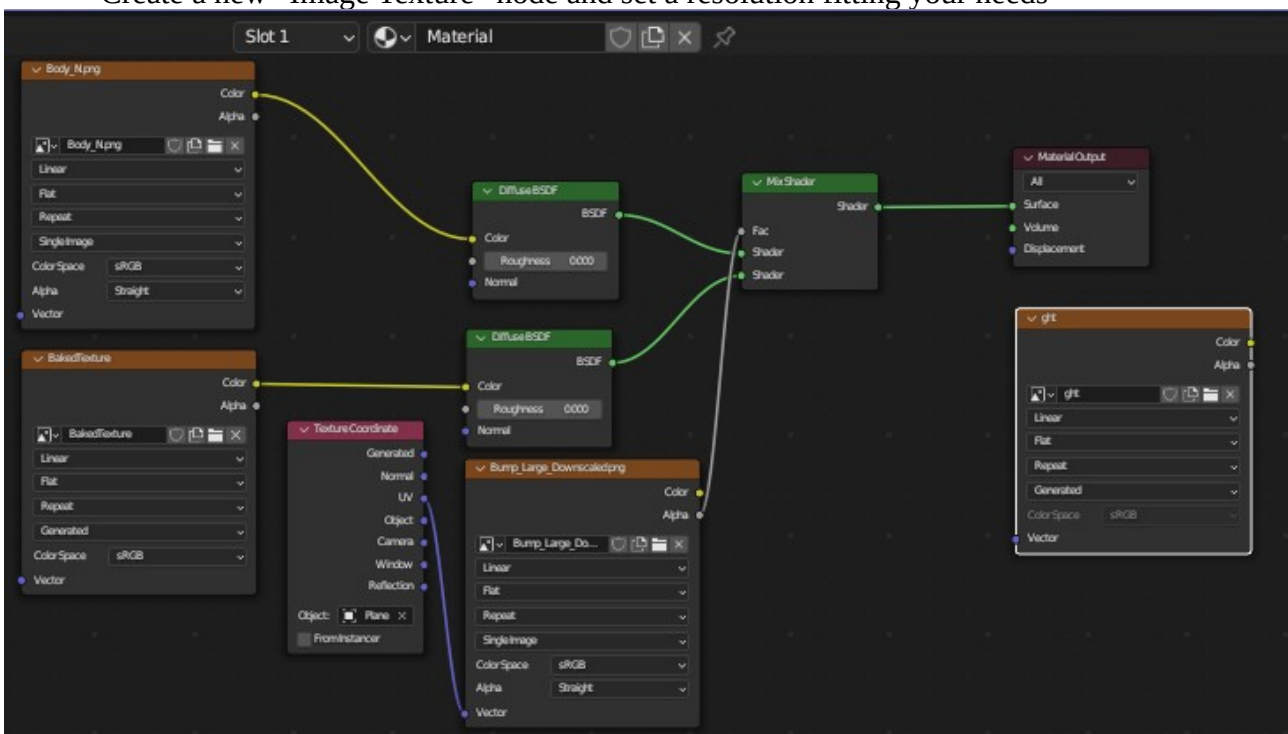
Render Settings

- With the newly created texture node selected, navigate to the "Render Settings" tab in the bottom right panel
- Using the same settings as in section II, change the "Bake Type" to "Diffuse" (as we don't want to generate a normal map out of another normal map)
- Under the newly created "Influence" sub-menu, disable "Direct" and "Indirect" as "Contributions" (as we don't have / want any light sources to affect the texture)
- Increase the "Margin" back to "16px" as standard DAZ textures have a little margin as a buffer
- In the sub-menu "Film" (not inside "Bake"), enable "Transparent" as it reduces the texture size
- Hit "Bake" and save the texture following the instructions of section II