Perfect Skin SSS

Manual Version 1.0

Content

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Important Information

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1. Overview

Perfect Skin SSS is a PoserPython script for Poser 9 and up to create realistic skin shaders based on subsurface-scattering. For Poser 11, shaders for Cycles may be created optionally. The script comes in two versions. The *Lite* version creates shaders for all surface areas used typically in human characters: the skin, the inner mouth, the eyes, and transparency mapped hair like lashes or brows. The *Pro* version provides additional features to add mask-based skin details like spots, frackles, make-up, tattoos, clothes, or faked eye reflections. Finally, both versions allow to set gamma correction for all used image maps and to replace image maps.

The created shaders are optimized to be used with gamma correction and indirect light, but also work well with other render settings. The script supports the most common figures for Poser, additional figures can be added easily. The script can be used to convert character materials into the specific *Perfect Skin SSS* shaders, to modify these settings at any time (also after closing the script, the scene, or Poser), and to add masked based features (Pro only).

Because *Perfect Skin SSS* allows very detailed control over the shaders, you may need some experience and many test renders to get the desired results. Nonetheless, the initial settings should work well in many cases, and then the script provides a literal *one-click-solution* for optimized shaders for human characters.

Section 2 explains the basic structures and controls of the *User Interface* of the script. Section 3 shows how to use script to convert the materials of a figure to *Perfect Skin SSS* shaders. The last three sections describe the various settings for each page in detail.

2. User Interface

The script either starts with its own window or docks into the *Poser Python Plugin Board*. On the top, is the button bar. Below is a text line that shows the name of the figure in the scene, the figure type used for UV-specific features, and the material type of the figure. Next comes a drop-down selection where you select one of the pages with controls for different material types or features.

The button bar has the following buttons:
- *Init*: This initialized the script with the figure currently selected in the scene.
- *Reset*: This resets the script to the starting state (without a figure).
- *Apply*: This applies the settings for the currently selected page.
- *Apply (X)*: If activated, all changes of the current page are applied directly.
- *Remove*: This removes the selected feature from the shader.
- *Preset*: This opens a menu to load or save own presets or to load presets from add-ons.

Depending on the selected page, some of these buttons may be not available.

2.1. General Controls

Except for the start page, all pages have a material list on the right side. Changes are only applied to selected materials. Thus, you may use different settings for different materials if needed. When you switch to a page, those materials that already have been converted to a *Perfect Skin SSS* shader are selected in the list.

All pages (except *start* and *image maps*) use the same kind of controls to define parameters:

- *Header*: A header is a centered text used to group parameters belonging together.

- *Checkbox*: Checkboxes are used for on/off features. If a checkbox is used as a header (i.e. centered), it applied to all parameters in that group.

- *Color*: The color in RGB format can be changed with the sliders for red, green, and blue value (from top down). Or you can click on the button on the right for the OS color selection dialog. This button has the actual color as background and shows the color values ranging from 0 to 255 as text.

- *Hue*: For all color image maps, there is a hue control where you can increase or decrease the strength of each color component. This is useful for fine adjustments or for variations like tanned skin. This control is similar to the color control, but has a range from -100 to 100.

- *Value*: All numeric parameters use a slider ranging from 0 to 100. (The actual values in the shader nodes are usually different.)

- *Image Map*: For image maps, the first button shows the name of the map (if any) and optionally a star to denote that the map uses modifications like scaling. A click on this button opens the *map dialog* (see below). The ... button opens a file selection dialog.

- *Sets*: Some features like overlays may be added several times with different settings. In that case, the first line of the page has a field for the name that identifies the set. Click on the *Select* button to select an existing set to modify or remove it.

Note: Value controls for the strength of bump maps are not linear as the other value controls, but have a quadratic curve. This gives you more fine control for lower values, but still allows rather high values, which are needed for maps with low contrast.

Note: The *hue* control is implemented by the *bias* function of the *color math* node. -100 means -0.5 and 100 means +0.5. Accordingly, the color used as background for the button is only a hint for the actual effect, which depends much on the colors of the image map. With the color selection button, you may extend the range for this control to the full range from -1 (200) to 1 (200).

Hint: When adjusting the hue, it is helpful to select one of the materials in material room and to activate the *X* button for immediate application of the changes. That way, you can see the color tone in the shader tree preview instantly.

Map Dialog

Image maps may be used as cut-outs that are applied only to a partial area of the full UV range. This means, the maps are scaled and placed to a particular topic. Use the map dialog to define these additional parameters. The *VU mapping* flips the image diagonally. The text fields shows the full path of the image map (either as relative or absolute path). You can select a file with the *File...* button. If you leave this field empty, no map is selected.

There are two versions of the map dialog, which you select in the *options* section of the *start* page. The standard version shows the *scale x*, *scale y*, *offset x*, and *offset y* parameters from the *image map* node directly. The *Flip X*, *Flip Y*, and *Flip UV* buttons flip the image without changing its relative position.

If *Center based image position* is active in the options, the map dialog displays the cut out based on the center and size in x and y direction. This is useful for maps that should be placed relative to a center point but may allow scaling.

Note: Images used as masks must have a black background and are white for the area, where the effect should be applied.

2.2. Material Conversion

When you apply a base material setting (skin, inner mouth, eye, or trans-map) to a figure for the first time, you are asked in a conversion dialog how to use the nodes of the existing shader. For *diffuse* color, *specular* color or value, *bump*, *displacement*, *gradient* bump, and *transparency*, you can select whether to use the actual input node of *PoserSurface* or to ignore it by activating *use input node*.

If the node should be used, you may restrict it with *map only* to the image map for this input, even if it is not connected directly to the according input. This is useful because shaders for characters may already use special nodes for more realistic effects, but these effects most likely would not work well when applied in addition to the *Perfect Skin SSS* shader.

If the shader has no bump map, you may select whether to use the displacement or diffuse input instead. In general, it's not much reasonable to use displacement on a skin texture except for special effects. It's better to use it on bump instead. While the option is offered to use the diffuse map as bump map as well, it is not recommended. All shaders provide a procedural bump anyway.

The option *ignore diffuse for specular* is much recommended. At least older materials have the diffuse map also connected to specular color, but this is no reasonable. This option will not use the specular color input if it is the same as the diffuse input. If *remove unconnected nodes* is checked, all nodes that where not recognized and used by the created shader are removed to clean up the material. In Poser 11, select the option *ignore displacement for Cycles* to not use displacement for Cycles, because Cycles doesn't support micro-facet displacement.

Of course, this conversion may not always be correct, because it relies on some basic assumptions about the original shader. For example, the color map should be connected either to diffuse color or

to alternate diffuse. Also, shaders may have oddities like using the same node input for bump and displacement. Hence, it may be necessary to have a look at the shader before conversion and clean it up manually.

Notes:

- If *map only* is active, only maps are used, no procedural shaders, even if there is no map.
- If no diffuse or specular map is found, the alternate diffuse or specular input is used.
- If alternate diffuse or specular is used, only the image map is used.
- If different nodes are connected to specular color and value, both are used.
- The conversion is done for each material separated, so results may differ.
- In Poser 11, all selected nodes are also used for the Cycles shader.
- You can define your own default presets to be used to initialize each page.

2.3. Start Page

The start page has three sections. The *initialize* section provides a one-click solution to convert materials. Under *options*, you find general settings. Finally, there is an *info* section with version number and copyright.

Initialize

When you click the *Apply* button while the *start* page is open, the settings in the *skin*, *inner mouth*, *eyes*, and *transparency mapped* pages are applied to all according materials, if these pages are checked in the *initialize* section. When you didn't change these settings, the defaults are used. You get only a single material conversion dialog, except if you select *separate conversion dialogs*.

This is the quickest way to convert all materials to *Perfect Skin SSS* shaders.

Note: You can define your own *default presets* to be used initially for figures not yet converted.

Note: If you use this on a figure that was already converted, it will simply apply the existing settings again. However, if you changed settings for individual materials only, they will be lost.

Options

You can select the *image filtering* setting for image map nodes that are created by the script. If you check *apply to existing map*, this setting is also used for all maps during material conversion.

If *Use relative path* is active, all image file selection dialogs convert the path to relative if it includes Runtime as folder.

With *Center based image position* checked, the map dialog displays the position and size of the cut-out relative to the center.

For Poser 11, you may check *Create Cycles nodes* to create distinct shader nodes for Cycles. This yields better results on SuperFly than using the FireFly shader tree.

2.4. Presets, Defaults, and Add-Ons

When you click the *Preset* button, you get a menu where you can load and save presets, copy and past page settings, restore a page to the settings from the shader, and load settings from an add-on.

Presets

You can *load* and *save* presets for each page. A preset consists of the values for all controls on a page, but it doesn't include the set name (if any). Optionally, you can also include the material selection, but this part will only work when the preset is loaded for the same figure type.

If you save a preset with the name *default* to the folder where the script is located, this preset is used to initialize the page settings for figures that don't have be converted yet.

Copy / Paste

Copy simply copies the current settings of a page and paste applies the copied settings.

Restore

With the *restore* entry from the preset menu, you set the settings for all controls to those retrieved from the shader in the figure. Of course, this is only possible if the materials were already converted. While the script uses the settings for the first material when you initialize a figure, the *restore* option is based on the selected materials. This is in particular useful if you used different settings for particular materials on the same page, e.g. the nails on the skin page.

The restore option is not available for pages with multiple sets. You can restore the values by selecting the set instead.

Add-Ons

All masked-based features support add-ons. An add-on is similar to a preset, but it is defined for specific figures, because the maps for masks have to match the UV mapping of a figure. If add-ons are available, they are listed at the end of the preset menu, usually by the product name. If you select an add-on, it displays a selection dialog, which may provide preview images. The *Pro* version of *Perfect Skin SSS* includes add-ons for eye reflection, nipple bumps, and lip masks.

I created add-ons for the tan-line products for Victoria 4 (Poser or DS) and DAZ generation 3 figures. You can download the add-ons from the Perfect Skin support section of my web-site. Other texture products from my store, my web-site, or third parties may be used as well with this script, but need to be set up manually.

Note: Further Add-ons may be released separately either at the Renderosity store or for free on my web-site. If you are a texture creator interested to provide add-ons for *Perfect Skin SSS*, contact me by e-mail.

2.5. Supported Figures

The following figures are supported by the *Perfect Skin SSS* script:
- Poser: Poser 3 - Poser 11, PoserPro, G2
- Content Paradise: Miki 1-4, Terai Yuki 2, NearMe, Grey Alien
- DAZ Genesis: Genesis 1-3
- DAZ Generation 4: Victoria 4, Michael 4, Kids 4, Vittorio 4
- DAZ Generation 3: V3, S3, A3, M3, D3, H3, Freak, L&L3, M&M3, Baby3
- DAZ Generation 1/2: Victoria, Michael, Stephanie/Aiko, Grim, Preschool, Preteen, Baby
- DAZ Girl: The Girl, Mermaid Girl
- 3D Universe: Sadie, Sam, Skye, Stacy, Sara, Dennis
- Dawn, Dusk, Gloria, Clark, Antonia, Apollo Maximus, Mavka, Project Human

These figures are recognized by their geometry file name. If a figure is not supported, you will get a *not supported* notification when you click the *Init* button.

In general, the script may be used with other figures or variations of the figures above as well. To add a figure, you have to edit the file *Perfect Skin SSS.fig* in a text editor. In the *!!!MATERIAL!!!* section, you add a line with the name of the geometry as shown in the *not supported* message and assign an id to it. If the figure is compatible with a supported figure, you use the id of the figure and you are done. Otherwise, use a new id and add line with the id and a name to display in the section *!!!NAME!!!*. Finally add a section named by the id with the following lines:
- skin = all materials used for skin
- nail = fingernails and toenails
- mouth = all wet parts inside the mouth; tongue and teeth have their own section
- tongue = tongue material
- teeth = teeth material
- eyewet = all wet areas surrounding the eye like lacrimal or eye socket
- pupil = the pupil
- eye = the iris
- sclera = the white of the eye
- cornea = the outer transparent layer of the eye if it covers only the iris and pupil
- cover = the outer transparent layer of the eye if it covers the complete eye ball
- eyehide = areas in the eye to hide completely
- trans = areas used for transparency-mapped hair like lashes

Use either *cornea* or *cover*. If a figure has both, use *cover* and put the *cornea* material under eyehide.

3. How to Use the Script

After starting the script, select the figure to work with in Poser. (The figure should already have a material with texture maps applied.) Click on the *Init* button to initialize the script with the figure. If the figure is not supported, you get an according message. Otherwise, the page selection drop-down box is enabled and the start page is displayed.

If you are using the script for the first time and just want a quick result, press the *Apply* button and then OK for the conversion dialog. Instantly, your figure is ready to render (but see below about render settings to set for correct results).

Otherwise, you may want to read a bit more of this manual and set the parameters in each page individually. Select a page, select the materials to work with (usually, this will be all materials), and click on the *Apply* button to convert the material or to apply modified settings to the shader.

If your figure already has a shader created, each page will show initially the settings that were applied last. While playing with different settings, you may activate the *X* button right to the *Apply* button to transfer all changes directly to the selected materials with requiring to press the *Apply* button. Of course, this only works if materials were converted before.

Important: Do not modify the shaders and nodes used by *Perfect Skin SSS* directly in the material room while the script operates on them. The script keeps references to the nodes and Poser will crash in case the nodes no longer exist. At best, close the script or click *Reset*, once you finished working on a figure or if you want to make direct changes. Also note, that changing the shaders directly may break the ability of the script to work with them.

Render Settings

For *FireFly* renders, you must activate the *Subsurface Scattering* checkbox in the render settings to have the subsurface scattering effect used in the render. Also, some materials use raytraced reflections, so you need to activate *Raytraycing* with at least 1 *Raytrace bounce*. Otherwise, you can use pretty much the usual render settings for preview or final renders.

For *SuperFly* renders, it is important to use a relative high number of samples (at least 8) for *Subsurface Samples* to prevent noise in the render result.

4. Skin Material

The skin shader of *Perfect Skin SSS* mixes subsurface scattering with diffuse. It applies a procedural pattern for specular highlights and bump that can be mixed with existing maps. The *skin* settings are divided into five sections, where two sections will hold for FireFly materials only.

For the diffuse texture map, you may adjust the *hue*, which is useful to adjust the hue or brightness of the skin texture to your likings or to work best with the SSS settings. This can be used for minor adjustments, but also for visible effects like tan or sunburn. The *roughness* parameter controls the softness of the pure diffuse part of the skin material.

The *SSS strength* blends the diffuse and the subsurface scattering part of the skin shader. Using 100% SSS may look too much like wax, so I recommend to blend in a small amount of plain diffuse. The *SSS size* defines the distance the light scatters below the surface. Again, too large values may look more like wax than skin. The *SSS color* defines the relative distance for each color component. Enhance the red component for a realistic look.

The *custom scatter* node of FireFly has several additional parameters, which can be set in the *SSS FireFly* section. Usually, the initial settings should work well, but feel free to try alternate values. The *ambient color* adds glow, so it is not realistic, but a small amount of red may give a more fresh look to the skin. *Pre SSS color* and *post SSS color* tint the subsurface scattering. Depending on the values, you may get color shifts at the borders, so be careful with this setting. In general, the post color should be complementary to the pre color to prevent overall tinting. Because the *custom scatter* node tends to darken the skin, the *brightness* parameter can be used to correct this. Finally, *quality* controls the *error maximum* of the *custom scatter* node, so smaller values will render faster, but with less quality.

For the highlights, *color*, *strength*, and *size* control the usual aspects of specular highlights. A slightly blue color prevents highlights from showing a yellow hue. The *pattern* setting controls how much of the procedural pattern and of the specular map are applied to the highlights. *Mix map* mixes the specular map and the procedural pattern. Note that this will reduce the strength of the pattern even if there is no specular map.

FireFly has the *blinn* specular node that creates highlights that are mainly visible for light from the side or back. SuperFly has no similar specular effect. The *Highlight FireFly* section controls the *strength* and *size* of this for this.

Finally, the *bump* section gives control over the bump. *Strength* is the amount of bump for the procedural pattern. The size of this pattern, which is shared by bump and highlights, is set by the *size* parameter. *Map strength* is the amount of bump from the bump map, if it exists.

Note: The nail materials use the same settings as the skin, but don't use the procedural pattern for bump and specular highlights. You may select the nail materials (at the end of the material list) only to adjust the nail materials separately, e.g. to reduce the SSS amount or for smaller and brighter highlights.

Skin: Spots (Pro Only)

The *spots* page creates or removes spots and freckles on the skin based on a procedural pattern. The difference between those two patterns is that freckles are smaller and more dense.

For both types of spots you can set a color, which is multiplied by the skin texture, as well as the density of the pattern and the size of the single spots. To use only one of these spots types, set the color for the other to white.

Skin: Tanline (Pro Only)

The tanline page uses a mask to separate between tanned and untanned areas. For white areas in the mask, the *untanned hue* from this page is used, for black areas the *texture hue* from the skin page is

used. Typically, tanline maps are white on black background, so you set the tanned hue in the skin page, not in the tanline page.

You may use any number of maps to define tanlines, even with different hue for the untanned area. Hence, you have to name each set. *Apply* creates or modifies the selected set, *Remove* removes the selected set. With *Select*, you can select one of the existing maps or clear the settings with *reset*.

Skin: Details (Pro Only)

The skin details are mixed into the skin shader. *Diffuse* color or maps are blended directly with the skin texture, so SSS and other effects are applied. This is useful for tattoos, freckles or other details of the skin. *Bump* maps are added to the existing bump, they don't replace it. Diffuse and bump may be applied together or separately. You may define any number of skin details identified by their name.

In some cases, it may be useful to apply a skin detail to the left and right side symmetrically. That's why there are two image maps for mask, diffuse, and bump map. Of course, you can also use a single map only or even no map to apply the effect to the complete material. When using two maps, they should not overlap and they should be black where the other map is not black.

The two *mask* maps must be white on black ground. The *blend* parameter controls how much of the skin color is replaced by the skin detail. Both *maps* are multiplied with the diffuse *color*. You may use the color without maps.

The bump section contains two bump *maps* and the bump *strength* only.

Skin: Overlay (Pro Only)

Skin overlays are added to the skin as a distinct layer. Unlike skin details, they replace the skin, but also may be blended with the skin for semi-transparent overlays. This feature is used for clothing, body hair, make-up, lip-stick, nail polish, or body painting. Again, two maps can be used for symmetrical overlays (see previous section for details). Any number of overlay can be applied. New overlays are added on top of the existing overlays. To move an existing overlay to the top, simply remove it and apply it again.

While each of the sections *diffuse*, *bump*, *highlight*, and *gloss* may be activated independently, a complete overlay should include diffuse, bump, and at least one of highlight or gloss. Otherwise, the according feature of the skin is used instead. However, there are also cases where this is intended. Transparent nail polish or lip-stick will consist of gloss only. Most make-up will still show the original bump of the skin. It's even possible to blend the bump (although without map) to partly replace or reduce the skin bump.

The *mask* maps are applied to all texture features. The *blend* parameter mixes the overlay with skin for transparency. Because bump is independent of transparency, it has its own *blend* parameter.

The *diffuse* component can be defined by one or two maps that are multiplied with the color. The *roughness* is the according parameter from the clay node in FireFly or diffuse node in SuperFly.

For bump, up to two *maps* can be used. The bump *strength* and the *blending* with the skin bump can be set.

Highlight is the standard highlight with *color*, *strength*, and *size*.

The *gloss* highlights also provide *color*, *strength*, and *size* as parameters. In addition, there is *sharpness*. The *reflect* parameter controls raytrayced reflection for FireFly. It is ignored by SuperFly materials in Poser 11, because highlights in Cycles always include reflection that can't be controlled independently. If you activate *glitter*, the gloss highlights are limited to small spots, for which you can set the *density* and the *size*.

5. Other Materials

5.1. Inner Mouth

The *inner mouth* page provides settings for materials inside the mouth with special settings for tongue and teeth, which use their own procedural bump patterns. For ease of use, the *hue* for all three areas can be set independently. To use different settings of the other parameters for some materials, you can select those materials in the material list before applying changes.

All materials inside the mouth are wet. The *wetness* section defines the *strength* for highlights and reflection and the *size* of the highlights. Pattern defines how strong the procedural bump pattern and the specular map are applied to the highlight, while *mix map* blends these two patterns.

The *bump* section defines the *strength* of the bump pattern and its *scale*. *Map strength* is the amount of bump for the bump map.

5.2. Eyes

The *eyes* page controls the materials of the eye (pupil, iris, and white) as well as the surrounding of the eye like lacrima and the eye hole. For each of these, the *hue* can be set independently.

Wetness sets the *strength* of reflection and highlights as well as the *size* of highlights.

Even if it is not really necessary to have a bump map on the eyes, you can set the bump strength, in case there is a bump map.

Note: If the figure uses a black diffuse color for the pupil, the hue for color is set to black initially. While making the pupils completely black is reasonable in theory, the geometry of the eyes may not separate iris and pupil clearly and the pupil material may contain parts of the iris on the image map. If the pupil hue is black initially, it should be safe to keep it black.

Note: Depending on the geometry of the eyes, the wetness is either applied to the eye cover surrounding the whole eyeball, to the sclera and to the cornea on top of iris and pupil, or to the sclera, iris, and pupil directly. If there is a cover and a cornea, the cornea is made invisible.

Eyes: Reflection Map (Pro only)

While raytraced reflections are most realistic, they require something to reflect in the scene. In some cases, it is easier to use a reflection map instead, which can be added by this page. Depending on the UV mapping of the eyes in a particular figure, a single map will be applied to both eyes, two maps will be applied to different eye materials, or two maps will be applied to one material at different positions.

The *strength* controls how much the reflection map is visible.

Note: If there is already a transparency map for the eye, it is replaced. It is restored if you remove the reflection map added by this script again.

5.3. Transparency Mapped Hair

It is a common technique to apply body hair like brows and lashes by a transparency map. In the simplest and most common case, this kind of material consists of nothing but a transparency map and a diffuse color. On this page, a bit more advanced setting is possible by adding highlights and using the transparency map also as bump. In addition, there is a control to change the thickness of the transparency map and to fix problems if the map isn't strictly black at the background.

You can set the *color*, the *highlight* strength and *size*, and the *bump* strength. With the *thickness* parameter, the brightness of the transparency map is enhanced or decreased, which results in a thicker or thinner appearance of the hair. In particular when enhancing the brightness, areas that should be fully transparent may become visible. Use the *fix* parameter to fix this problem.

6. Image Maps

The *image maps* page lists all texture maps (i.e. files used by *image map* nodes) of the figure. The *GC* button indicates if the map is set up for gamma correction. Only color textures should use gamma correction, but not image maps for specular maps, bump, displacement, normal maps, or transparency masks, because these maps contain numeric values, not colors.

Note: The script configures all maps to use gamma correction as required. Nonetheless, you may check here if everything is set as it should be.

You can also use this page to replace texture maps, e.g. if you want to use a face texture with a different makeup painted on it. Click the O button to select a new texture map or enter the full or relative path in the text field directly. Optionally, click the > button to select all materials where this map is used, or select the maps where you want to replace the map. You may replace a map only for selected materials.

When you click the *Apply* button, all changes are applied and the page is reinitialized to reflect the changes.