Artitude

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Artitude gives your footage the look of a wide variety of real-world media such as Oil Paint, Watercolor, Colored Pencil, Markers, Tempera, Airbrush, etc. and allows you to simulate styles and artists, including Cartoon, Illustration, Van Gogh, Warhol, Graphic Novel, and many more. It comes with over 125 pre-designed looks and styles in the form of named presets.

Non-photorealistic rendering (NPR) focuses on enabling a wide range of expressive styles for video imagery. In contrast to traditional video, which has focused on realism, NPR is inspired by artistic styles such as painting, drawing, technical illustration, animated cartoons, etc. NPR has appeared in movies and video games in the form of "toon shading", as well as in scientific visualization, architectural illustration and experimental animation. An example of a modern use of this method is that of hand done cel-shaded animation of Richard Linklater's films Waking Life and A Scanner Darkly and his Charles Schwab commercials.

Artitude uses state of the art NPR rendering techniques and allows you to combine them in powerful, unprecedented ways to create organic, animated effects never before possible. It incorporates years of my own experimentation and research in the field and experience gained in prior NPR plugins I have written. **Artitude** is based on FxFactory's plugin engine which makes use of the power of your GFX card to do its rendering, thus does not load down your CPU. It is compatible with the hosts that FxFactory supports, currently FCP 6 through Final Cut X, Motion 3 upto Motion 5, Adobe Premier, and After Effects. It requires at least 10.7 (Lion) of the OSX operating system.

How to use the Artitude plugin

Artitude has 5 sections that can be used to process your image in a wide array of manners. They are **Paint**, **Texture**, **Smooth**, **Toon**, and a final processing section. **Artitude** initially analyses the image, finding edges and local "flows" and uses this analysis for subsequent processing. You have a **Tweak** adjustment to adjust the "smoothness" of this analysis.

Paint allows for an initial gamma adjustment and color correction to intensify and sharpen colors as well as two styles of painting simulation, a caricature-like organic distortion, and a thresholded gaussian blur to "smudge" the results. **Texture** contains processing for outlines, stipple, and shading. **Smooth** provides powerful bilateral smoothing that retains edges with an adjustable threshold and iteration. **Toon** separates the image into Hue, Saturation, and Luminance and allows discrete quantization of each channel, with adjustments and the ability to map the hue to real world ink colors. Final processing allows you to mix any of these sections or a combination of them with any other section using *Photoshop style* blend modes and a slider for intensity of the blend as well as a final edge sensitive smoothing. If any section is not used to create the final image (Toon, for instance), that section of image processing is bypassed.

Because of the high processing costs associated with these powerful techniques, **Artitude** has a **Turbo** mode that increases interactivity at the cost of some resolution. Once you're happy with your look, turn off **Turbo** and render.

With the of huge variety of potential combinations of coloring, textures, blends, sliders, etc... the sheer number of different settings available in **Artitude** borders on the infinite. Only a subset of those will produce a result appropriate for your project. One way to handle this is to start with a preset that is close to what you think you might want and tweak it until you get a result you like, but I like to encourage experimentation as well.

Artitude Control Layout

The Artitude plugin has 5 sections to it: **Overall adjustments (which includes presets), Paint, Texture, Smooth,** and **Toon**.

The Overall Adjustments section allows you to choose **Source 1** and **Source 2**, with an optional blend mode between them, a slider that controls the intensity of the blend, a final smooth and the ability to "tweak" the initial image analysis.
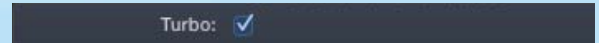

Image processing places heavy demands on your graphics card and high resolution, extensive effects, and/or lower power GPU (laptops and iMacs) can slow interactivity by causing pauses between adjustments and seeing the results of those adjustments. To improve response in those situations, the **Turbo** mode sacrifices some resolution to increase processing speed. Normally, this would be turned off for final rendering, however, it can be used to increase the "coarseness" of an effect. The **Turbo** setting is NOT retained in the presets.
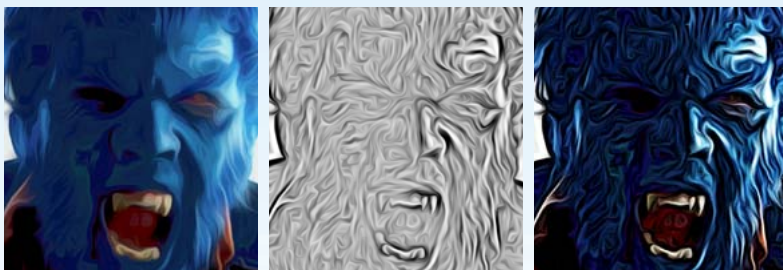
Presets
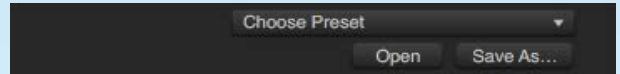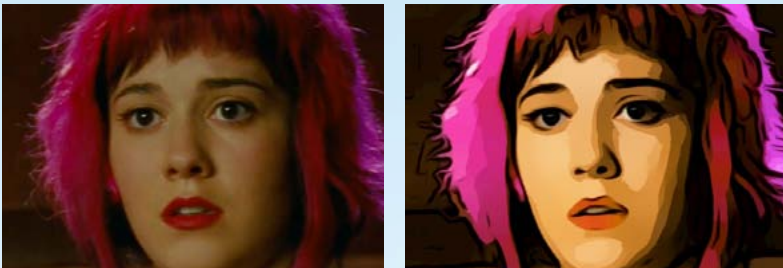
The **Presets** section gives you access to the named preset looks provided and gives you the ability to save and load your own.
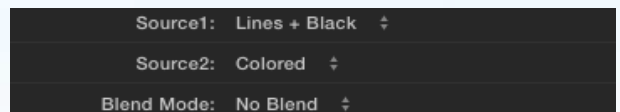
Blending

Source 1: *All* Source 2: *Lines Only* Blend Mode: *Vivid*

Blending lets you chose two sources and apply a Photoshop style blend mode and adjust the degree of the blend between them. **Source 1** acts as the base, **Source 2** acts as the blend.

When making changes to sections, set **Source 1** to that section and set the blend mode to **No Blend** to best see the results of those changes.

Source 1: *Lines + Black* Source 2: *Painted* Blend Mode: *No Blend*

See the appendix for a discussion of blend modes.

Final Smooth and Tweak

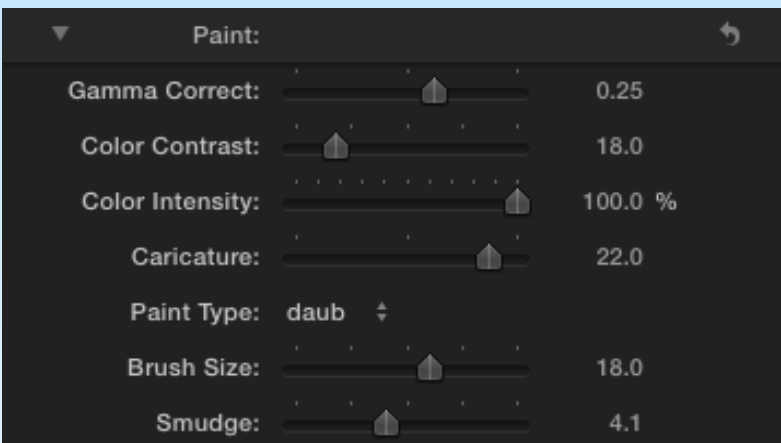
Final Smooth: 1.0

Final Smooth: 30

| Final Smooth: | 13.0 |

Final Smooth is the last processing step to the image. It can provide minor cleanup, or drastically alter the image appearance.

*Tweak: 1.0*

Tweak 10.0

| Tweak: | 2.5 |

Artitude initially analyses the image, finding edges and local "flows" and uses this analysis for subsequent processing. The **Tweak** adjustment affects coherence and the "smoothness" of this analysis and can have a radical effect on the image processing.

Paint Section

Paint:
Gamma Correct: 0.25
Color Contrast: 18.0
Color Intensity: 100.0 %
Caricature: 22.0
Paint Type: daub
Brush Size: 18.0
Smudge: 4.1

Paint has gamma adjustment, color correction to intensify and sharpen colors, a caricature-like organic distortion, as well as two styles of painting simulation, and a thresholded gaussian blur to "smudge" the results.
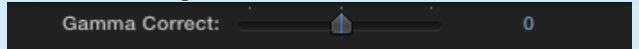
| Gamma Correct: | 0 |

Gamma Correct performs a simple gamma adjustment. Raising gamma lifts the mid-tones, lowering gamma drops them.

Raising the gamma can be helpful when extracting lines from shadow areas. If a preset produces an image that is too dark or light, try adjusting Gamma.
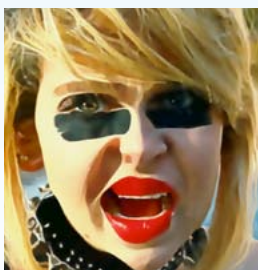

Color Contrast 0

Color Contrast 20

Color Contrast 70

| Color Contrast: | 18.0 |
| Color Intensity: | 75.0 % |

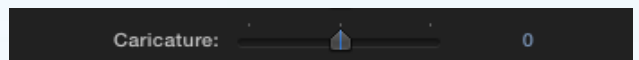**Color Contrast** sharpens and intensifies the colors. **Color Intensity** control's how strongly the effect is seen.

Caricature negative

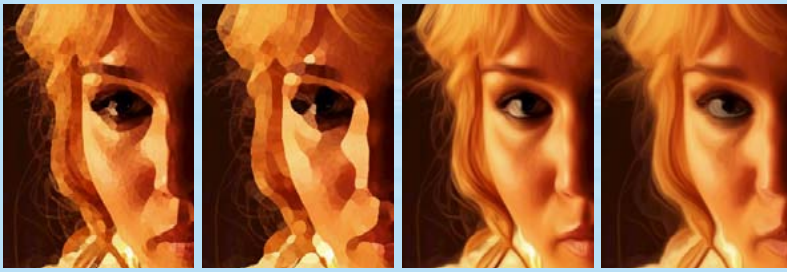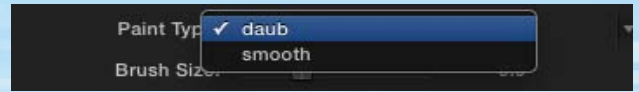

Caricature zero

Caricature positive

| Caricature: | 0 |

Caricature provides an organic distortion that, when negative enlarges dark areas and shrinks light areas, and when positive, enlarges light areas and shrinks dark areas.

Daub low   *Daub high*   *Smooth low*   *Smooth high*

There are two choices for painting styles, **Daub** and smooth. **Daub** simulates broad splotchy painting style. **Smooth** is more like longer smooth brush strokes. **Smooth** is also influenced by the **Tweak** setting (Daub is not).

Smudge performs a thresholded gaussian blur to retain hard edges, but blend areas of less detail. It can be useful in reducing noise or in air brush effects.

Texture Section

Texture extracts outlines, stipple, and/or shading from the image. It can use varioius sources to generate the texture, including the colored, painted, original, smoothed, or tooned image. This texture may then be painted over the **Paper Color** background using the **Line Color**, or the image itself (either the colored, painted, or original image). Finally, **Artitude** allows you to set a level below which everything will be rendered as black.

Simply generating the texture from the image alone can result in noisy lines and textures as the process is driven by differences in each frame. To avoid this, **Artitude** creates a frame of random noise (from the Seed value). It then, combines the random texture with the image and, controlled by the **Shading** and **Clip** values, makes it more likely to generate textures where the image is more complex, and less likely where the image is brighter.

The random noise is the same for each seed value, so when the viewpoint pans or zooms, this sometimes results in the so-called *Shower Door effect* - that is, the texture seems to be stationary while the image moves through it. See the discussion under Seed/Shift for more info.
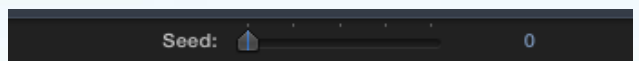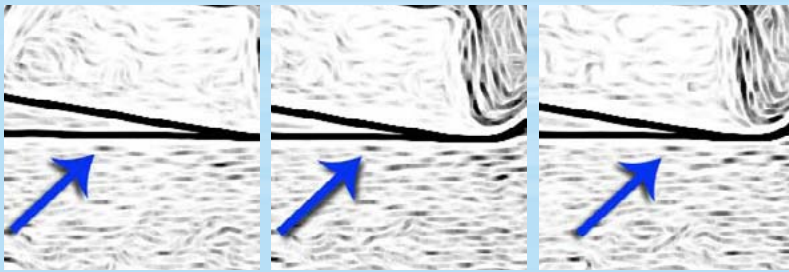

Seed and **Shift** can be used to prevent the so-called *Shower Door Effect*. One way is to use the **Shift** value to slide the texture to match the camera pan. A second method is to animate the **Seed** value, which will cause the texture to change with the seed (this can also be used to add "life" to
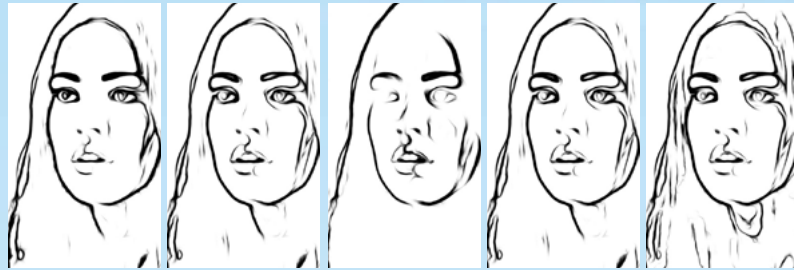
continued...

Seed: 0   *Seed: 9*   *Seed: -1*

note texture *does not move* *use Shift to move*

Shift: 0

static scenes by causing constantly shifting lines/ textures). A third way is to set the **Seed** value to –1. This will cause the texture to be generated from variations in the image itself, however, as noted above, this may result in a noisy image.

Colored *Painted* *Original* *Smoothed* *Tooned*

Lines From:
- Colored
- ✓ Painted
- Original
- Smoothed
- Tooned

The texture can be generated from the **Colored** output (most common), the **Painted, Original, Smoothed,** or **Tooned.**

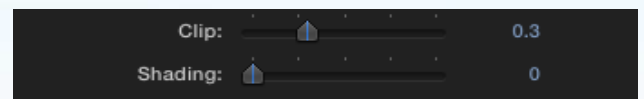*Increase Coarseness* *Starting Point* *Increase Width*

Coarseness: 1.0
Width: 0.68

Coarsness and **Width** work with each other to alter the appearance of the texture.

Length: 0 *Length 10*

Length: 0.69
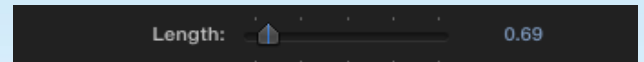
Lines start as dots and are dragged along the the path of the local flow – this is governed by the **Length** parameter. This and **AntiAlias** are both affected by the **Tweak** parameter.

Density low *Density high*

Density: 1.0

Density, as you might expect, controls how dense the texture is.

Low Clip, High Shading *Raise Clip* *Drop Shading*

Clip: 0.3
Shading: 0
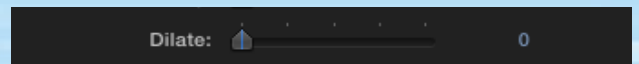
Clip and **Shading** work together to control the definition of the textures. Bringing up Clip, cuts out textures in lighter areas, bringing down **Shading** causes textures to be generated less in lighter areas.

Dilate: 0   *Dilate: 2*

Dilate: 0

Dilate takes the existing texture – as built by all the other parameters – and essentially draws a line around it to enlarge it.

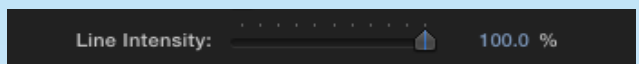*No Antialias*   *Low Antialias*   *High Antialias/Tweak*

Antialias: 0

Antialias applies an edge sensitive smooth along the lines to reduce aliasing. At higher levels, it can have interesting effects, especially as it is influenced by the **Tweak** parameter.

Line Intensity: 50%   *Line Intensity: 100%*

Line Intensity: 100.0 %

Line Intensity controls the transparency of the texture when composited over the final image.

Line Color   *Colored*   *Painted*   *Original*

Paint Lines: Line Color / ✓ Colored / Painted / Original

Once generated, the texture can be painted using the **Line Color**, **Colored** image, **Painted** image, or **Original**. Using the **Colored** can add back detail lost in the Paint settings. **Original** is usually darker than the **Colored**, but still follows the image's color.

Blue Paper Color, Red Line Color   *Black Paper Color, White Line Color*

Line Color: ▼

Paper Color: ▼

Line Color is the color for the Lines. **Paper Color** is the color of the background. When Viewing Lines Only, the image is always displayed with black texture over a white background. Lines + Black and other views use the **Line Color** and **Paper Color** settings
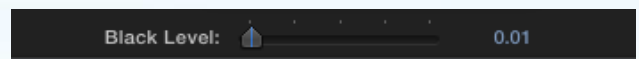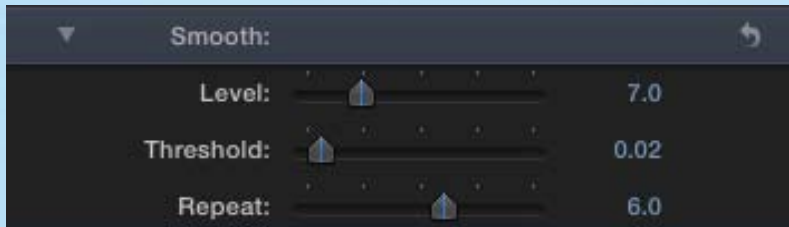

Black: 0.0   *Black: .01*   *Black is not Line Color*
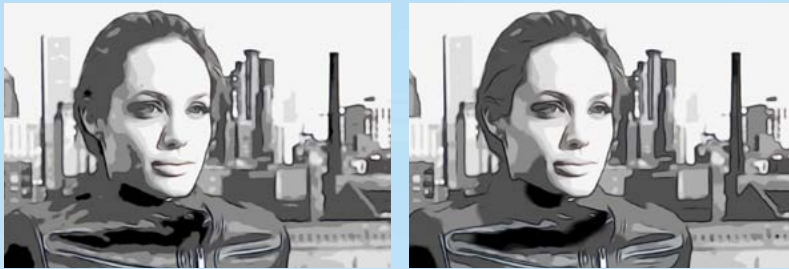
Black Level: 0.01

The final setting in the Texture section is the **Black Level**. This is independant of any Tooning or color correction. All material below this level will be set to black. Note this is actual Black and not influenced by **Line Color**.
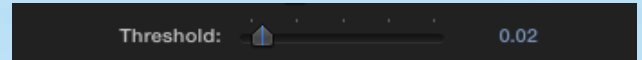
Smooth Section

The **Smooth** section takes the output of the **Paint** section and applies a powerful bilateral smoothing filter. This is an edge respecting filter, with edges determined by the threshold value. **Repeat** is an iterative process. The filter is repeatedly appled.

It is sometimes easier to see the effects of your changes by looking only at the **Luma**. Lower **Threshold** retains more irregular shapes, Higher **Threshold** smoothes them.

*Lower Threshold*   *Higher Threshold*

Toon Section

Toon may look complicated as it has a large number of controls, but the process is simple. The image is broken into Luminance, Saturation, and Hue channels, and then you may quantize each channel by specifying the number of levels they should have and adjust where those levels fall.

I'll describe the process for Luma and the same applies for Saturation and Hue, with some variation for Hue.

Hue, because it describes a circle, not a scalar (like saturation and luma), has some special settings, like the ability to map the hue to the values of real-world inks used in the Golden Age of comic books, and a **Tweak** parameter to "nudge" things into lower or higher levels.
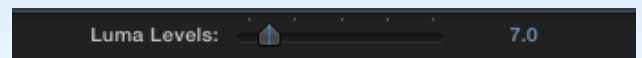
There are a couple of additional adjustments that are specific to the **Toon** section - **Brightness** and **Saturation**.
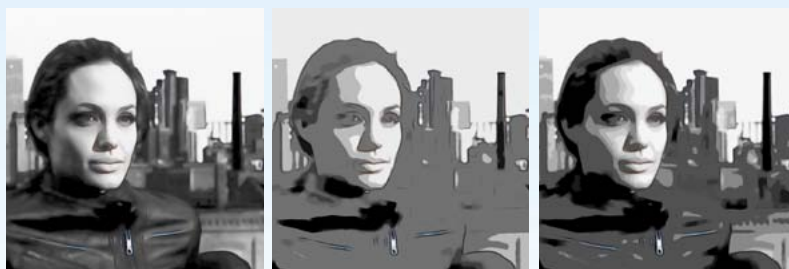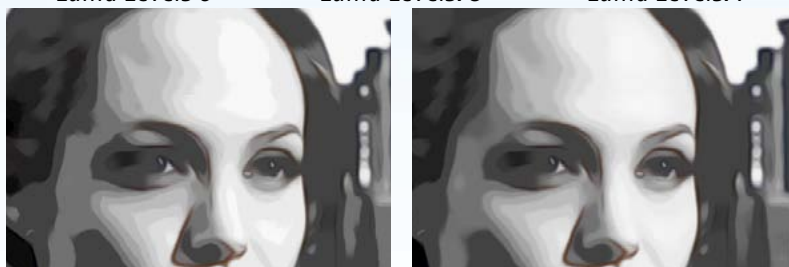
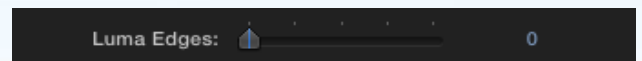*Luma Levels 0*   *Luma Levels: 3*   *Luma Levels: 7*

Luma Levels (like the other Levels), breaks the spectrum of luminance into discrete bands. To see this best, set **Source 1** to **Luma** (with Blend at No Blend). **Luma** Level of 0 is used for to disable quantizing, in otherwords, the continuous spectrum of luminance is used.

Luma Edges softens the blend between the discrete luma levels.

Luma Edges: 0   *Luma Edges: 25*

Shift Edges Down — *Default Luma Edges* — *Shift Edges Up*

Shift Luma Edges: 0

Shift Luma Edges is to move where the breaks between luminance levels occurs.

Hue Levels: 32 — *Hue Levels: -1.0*

Hue Levels: 62.0

Hue Levels behaves similarly to the other Levels sliders, with the exception if you set the Levels to −1.0, the colors are mapped to the hues of real-world inks used in the golden age of comic books.
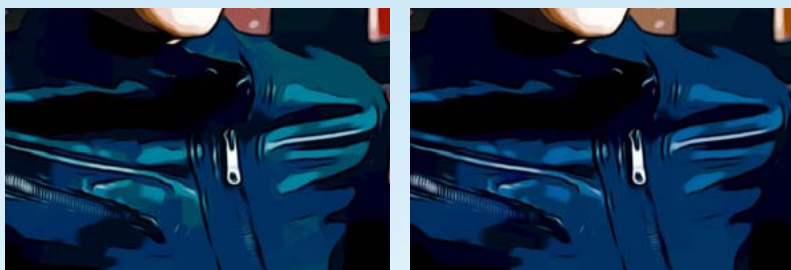

Shift Hue: 0 — *Shift Hue: -200*

Shift Hue: 0

Shift Hue unlike the **Shift Luma** or **Shift Sat** sliders, allows you to freely rotate the hue around its range. So if you end up with a blend mode that inverts your colors, you can use the **Shift Hue** slider to bring them back around.
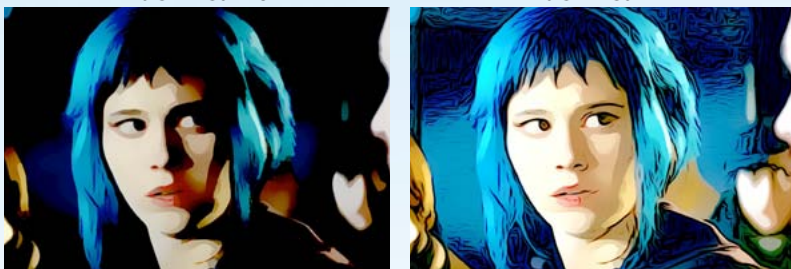

Hue Tweak: 0 — *Hue Tweak: .2*

Hue Tweak: 0

Hue Tweak allows you to "bump" regions that are close to the edge of one hue value into the adjacent region.

Brightness: 0 — *Brightness: 0.33*

Brightness: 0

Brightness does not function like a standard brightness control. Rather it dissolves between the Luma Channel and the Lines + Black setting - effectively raising the brightness without affecting the Lines/Textures.

Saturation: 0.5 — *Saturation 1.0* — *Saturation: 1.5*

Brightness:
Saturation: 1.0

Saturation, like **Brightness**, does not affect the Line/Textures. Below 1.0, it reduces saturation, above it raises saturation.

Blend Mode Appendix

Let's start with some basics. All the pixels in your layers are really just numbers. For our purposes, think of them as a range from 0 for black to 1 for full brightness. Pixel values of 0.5, 0.5, 0.5 for RGB, for instance, yield middle gray.

If you get that, the rest is easy. Blend modes are simply mathematical ways of combining Source 1 with Source 2.

All of the Blend Modes are affected by the percentage that Opacity is set to. Basically, it takes the result of the blend and mixes it by back into the Source 1 (or Base) image. If Opacity is set to 50%, the result will be a mixture of half of the Source 1 image and half of the blended image.

Let's establish a naming convention. We'll call Source 1 the "Base" and Source 2 we'll call the "Blend".

Dissolve simply takes Blend.

> Final = Blend

Subtract takes the Blend and subtracts it from the Base.

> Final = Base - Blen

Add is Blend added to the Base.

> Final = Blend + Base

Multiply is the Blend multiplied by the Base.

> Final = Blend * Base

Screen inverts Blend, multiplies it by the inverse of Base, then inverts the result

> Final = invert (invert (Blend) * invert (Base))

Darken compares Blend and Base and choses the darkest value.

> Final = minimum (Base, Blend)

Lighten compares Blend and Base and choses the lightest value.

> Final = maximum (Base, Blend)

Blend Mode Appendix Continued

Color Burn takes the inverse of Base and divides it by the Blend, then inverts the result.

> Final = invert (invert (Base) / Blend)

Color Dodge is Base divided by the inverse of Blend.

> Final = Base / inverse (Blend)

The next ones are somewhat complicated...

Overlay takes each pixel from the Base and if it is brighter than .5, it performs a Screen operation, otherwise it performs a Multiply.

> Final = Base > .5 ? Screen (Base) else Multiply (Base)

Hard Light is the same as Overlay, but it switches Blend and Base.

> Final = Blend > .5 ? Screen (Blend) else Multiply (Blend)

Vivid Light takes each pixel from the Blend and if it is brighter than .5, it performs a Color Dodge operation, otherwise it performs a Color burn.

> Final = Blend > .5 ? Color Dodge (Base) else Color Burn (Base)

Now, we take each channel (RGB) and performs the blend operation on them. Starting with a Color gradient for Base and Blend, here's how they look.

Subtract	Multiply	Darken	Lighten	Screen
Color Burn	Color Dodge	Linear Burn	Linear Dodge/Add	Overlay
Softlight	Hard Light	Vivid Light	Linear Light	Pin Light

If you'd like to learn more about blend modes, visit this web page for an in-depth discussion.
http://photoblogstop.com/photoshop/photoshop-blend-modes-explained