Watercolor Transformation Notes
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Introduction

The Watercolor transformation renders images in a way that resembles a watercolor painting as illustrated below.

What Watercolor Does

The idea behind creating a painting from a photograph is to first simplify the image by removing detail and then to make the remaining elements of the image stand out. Sometimes an image that doesn't work well as a photograph comes alive as a painting. Paradoxically, sometimes a loose painting succeeds at capturing the feel of a place more than a sharp photograph, and problems such as blown highlights and blocked shadows that can detract from a photograph can make a painting luminous. Generally, simulated watercolors look best displayed or printed large and viewed from close up -- the further away you get the more they revert to looking like the photograph from which they were derived.

The Watercolor transformation works by performing a specific series of operations on the input image. At each stage you can fine tuned the result by adjusting the corresponding settings.

Step 1 - Resize

Before any other operations are performed, the input image is resized. This is done by specifying the maximum dimension (width for landscape or height for portrait) in pixels of the result image. Generally the image size is reduced in order to reduce the amount of detail in the image, but if the input image is already small, resizing it larger may also produce good results. Setting the maximum dimension to zero sets the result image to the same size as the input image. The larger the output image, the more detail it will capture but the less impressionistic it will be. The following examples illustrate the effect on a section of the input image of doubling the output image size.
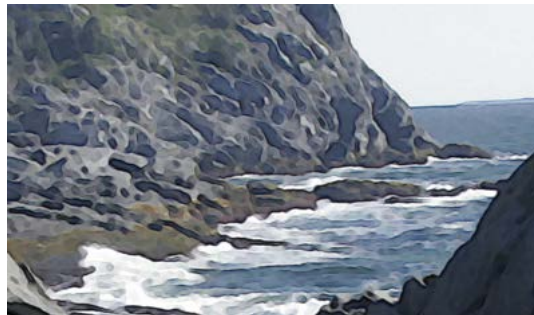
Max Dimension = 2000   Max Dimension = 4000

Step 2 - Reduce Detail by repeated Median Filtering

The next step is to blur the image by performing multiple passes of median filtering. The larger the median radius and the more median passes, the more the image is simplified.

Horizontal Radius = 2, Vertical Radius = 2   Horizontal Radius = 4, Vertical Radius = 4

Horizontal and vertical filtering can be controlled independently so as to vary the effect.

Horizontal Radius = 0, Vertical Radius = 4   Horizontal Radius = 4, Vertical Radius = 0

Finally there is a threshold setting that lets you dial back the tendency of median filtering to blur detail and round corners. The following example shows different threshold values applied to a radius 5 median blur.
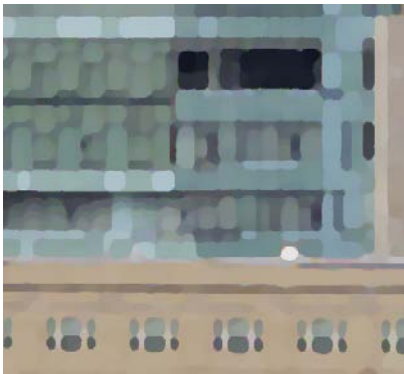

0%

25%

50%

75%

100%

Step 3 - Sharpening

The next step is to sharpen the result of median filtering using unsharp masking. Since median filtering tends to preserve areas of solid color, sharpening accentuates the boundaries between the solid color regions and makes them stand out a little like brush strokes. The larger the sharpening radius, the more sharpening is performed. Increasing the sharpening threshold prevents indistinct edges from being sharpened.


Sharpen Radius = 1   Sharpen Radius = 5

Step 4 - Edge Darkening

The final step is to darken the edges of the sharpened image. This simulates the way watercolor tends to pool and deposit pigment at the edges of a brush stroke and further emphasizes the boundaries between solid areas by giving them a dark outline. The more edge darkening is performed, the stronger the effect and the darker the overall image.
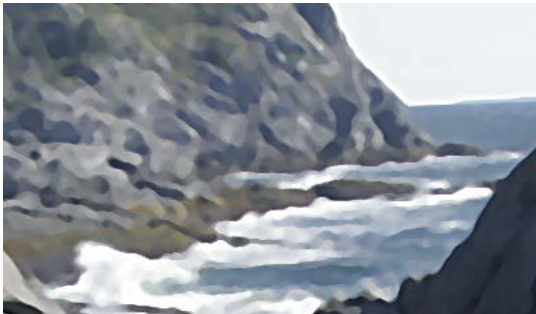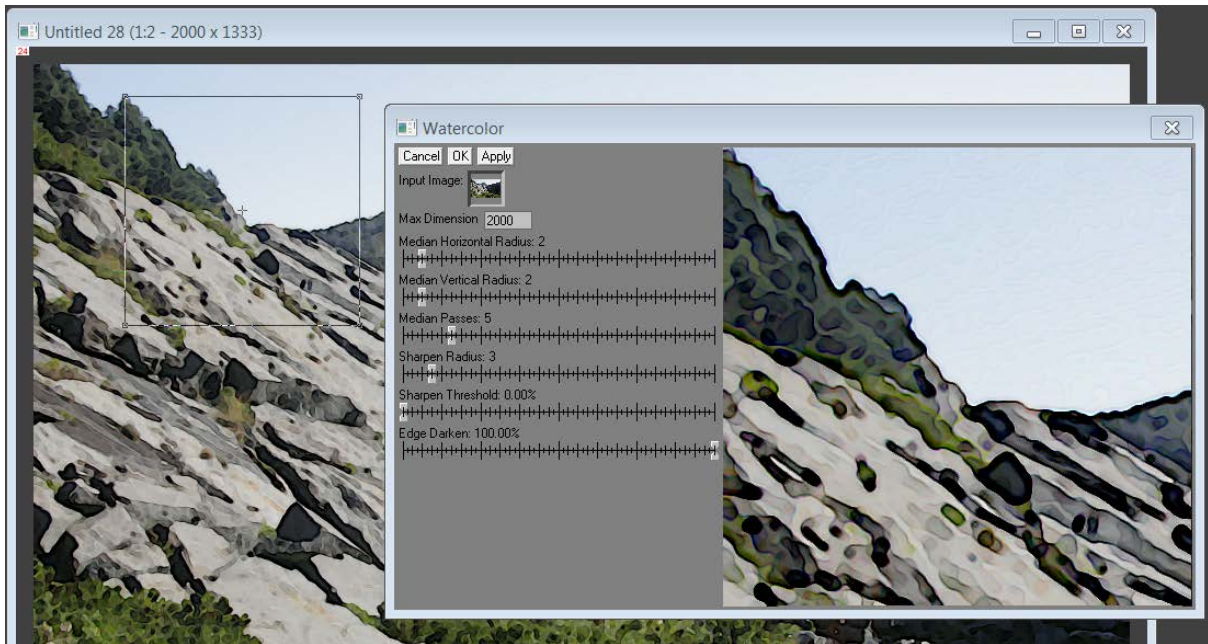

Edge Darkening = 0%   Edge Darkening = 100%

The User Interface

Preview

Preview works a little differently than other transformations. The right hand side of the Watercolor dialog box shows a preview of the part of the result image that corresponds to the highlighted rectangle overlay displayed over the input image. You make the preview larger or smaller by resizing the Watercolor dialog box. To select the part of the image to be previewed, drag the overlay rectangle.

The remaining controls have been described above -- the best way to fully understand them is to experiment on some of your own images.