softwhile

CrispImage Pro Plug-in for Adobe Photoshop* User Guide

Revision 1.1

Capabilities

CrispImage Pro provides state-of-the art image sharpening for Adobe Photoshop users using Windows 98/Me/2000/XP. It fully supports 16 bits per channel images in gray scale, RGB, LAB and CMYK.

Licensing

When CrispImage Pro is first installed, it will operate on a temporary license for 14 days. During this period the program is fully functional. A permanent license can be purchased by visiting http://www.softwhile.com. A purchased license key can be entered by clicking the License button.

Image Sharpening Approach

Photographic image sharpening can be viewed as a corrective action. Images are not sharp because the camera, scanner or printer blurs the image for various reasons, and so does the photographer by resizing the image, not focusing properly, etc. Because the reasons images require sharpening are multiple, it makes sense to break image sharpening into multiple steps, each tailored as well as possible to what causes the unsharpness. Sharpening can be broken into three general steps:

1. Capture Sharpening
2. Corrective or Creative Sharpening
3. Display Sharpening

Capture Sharpening

The goal of capture sharpening is to correct for the unsharpness that results from the way the image is digitized. Anti-aliasing filters, imperfect lenses, undersampling and other things cause the digital image straight from the camera or scanner to require sharpening. Of course all digital cameras and most scanners provide 'built-in' sharpening which can to a reasonable job of capture sharpening. The user can choose to leave this step to the camera or scanner, but for more control and a more effective sharpening, the Capture Sharpening function in CrispImage Pro should be used.

Corrective or Creative Sharpening

Corrective sharpening is done to correct problems caused by an unsteady camera, focus and depth-of-field problems, image resizing, etc. Corrective or creative sharpening is commonly applied to only a portion of the image. This corrects a sharpness problem with a selected area of the image without magnifying noise or over-sharpening other areas.

Display Sharpening

Displaying an image means viewing it on a computer monitor, or printing it. Both of these can reduce the sharpness of an image and should be pre-corrected. Many printer drivers contain sharpening which may or may not do a sufficient job of sharpening to correct for the printer.

How to Sharpen for Printing

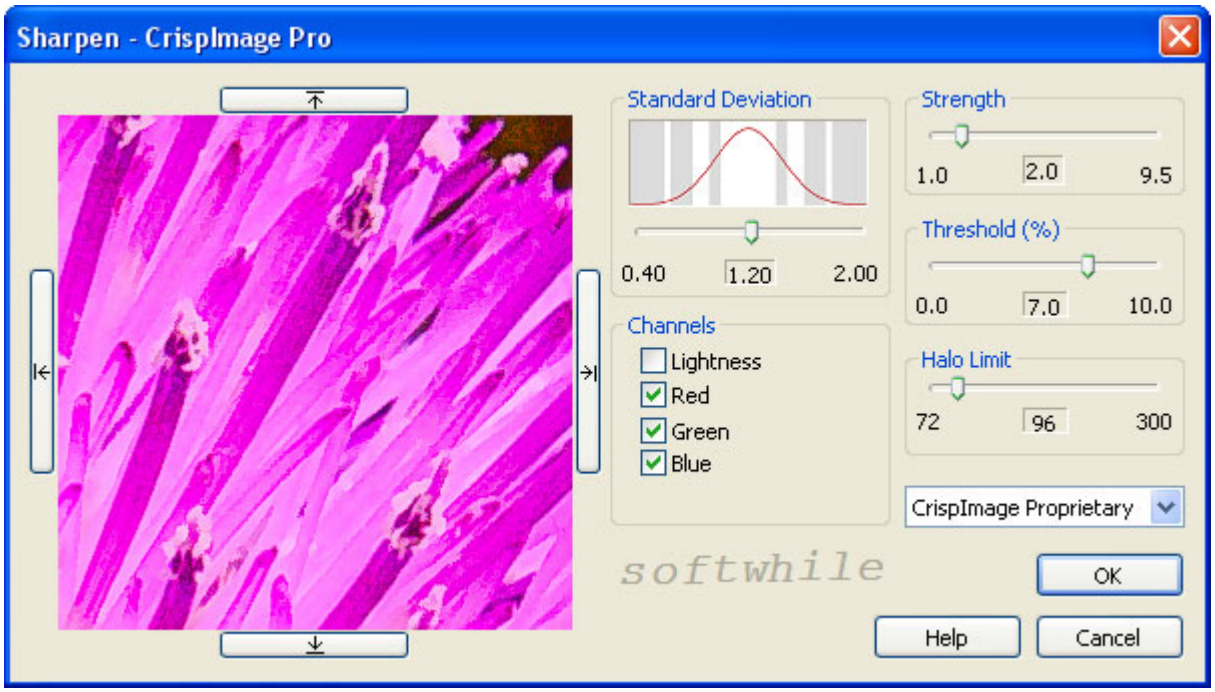
1. Do noise reduction, if necessary.
2. **Capture sharpen** if sharpening was not done by camera/scanner.
3. Do any editing desired.
4. Apply **corrective sharpening** as needed. This may affect only selected areas of the image.
5. Resize for printing. If the resizing was significant enough to affect sharpness, then apply **corrective sharpening** to the whole image.
6. **Sharpen for printer** using the Ripple Mask sharpening method.

How to Sharpen for Web Display

1. Do noise reduction, if necessary.
2. **Capture sharpen** if sharpening was not done by camera/scanner.
3. Do any editing desired.
4. Apply **corrective sharpening** as needed. This may affect only selected areas of the image.
5. Resize for web display.
6. **Sharpen for monitor** using the LaPlacian Mask sharpening method.

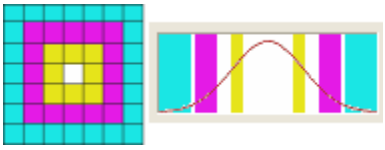
Sharpening Controls

Each sharpening method have several possible controls to adjust the effect on the image.



Standard Deviation

If the transformation involves a Gaussian function, the standard deviation can be modified to change the way pixels at various distances affect the change. The gray bands show the distances within the three squares that surround a pixel, as shown on the right.



Strength

The strength setting affects the intensity of change in pixel values. 1 is the lowest strength setting and usually results is very small changes in the image.

Threshold

The threshold percentage is a level of variation, below which no change to a pixel is made. This is normally used to avoid increasing low level variation (noise) in a homogeneous area like a clear sky.

Channels

The corrective sharpening transformation can be applied to individual color channels if desired.

Halo Limit

Many sharpening methods have a side effect of creating a 'halo' or light area around a dark edge (or a dark area around a light edge). A small amount of halo can provide some 'apparent' sharpness, and provide some correction of dot gain in prints.

Masks

La Placian Mask

Traditional	in CrispImage
-1 -1 -1	-0.707 -1.000 -0.707
-1 8 -1	-1.000 6.828 -1.000
-1 -1 -1	-0.707 -1.000 -0.707

Unsharp Mask

standard deviation = 1

0.000	0.000	0.001	0.002	0.001	0.000	0.000
0.000	0.003	0.013	0.022	0.013	0.003	0.000
0.001	0.013	0.059	0.097	0.059	0.013	0.001
0.002	0.022	0.097	0.159	0.097	0.022	0.002
0.001	0.013	0.059	0.097	0.059	0.013	0.001
0.000	0.003	0.013	0.022	0.013	0.003	0.000
0.000	0.000	0.001	0.002	0.001	0.000	0.000

Cross Section

Ripple Mask

Mask values

-0.107	-0.153	-0.223	-0.252	-0.223	-0.153	-0.107
-0.153	-0.284	-0.348	-0.320	-0.348	-0.284	-0.153
-0.223	-0.348	0.152	1.536	0.152	-0.348	-0.223
-0.252	-0.320	1.536	2.886	1.536	-0.320	-0.252
-0.223	-0.348	0.152	1.536	0.152	-0.348	-0.223

Cross Section

-0.153 -0.284 -0.348 -0.320 -0.348 -0.284 -0.153
-0.107 -0.153 -0.223 -0.252 -0.223 -0.153 -0.107