Pixel Vistas *EasySharp* 1.0 User Guide

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1. Introduction & Background

Thankyou for downloading Pixel Vistas *EasySharp*! *EasySharp* is a filter plug-in for Adobe® Photoshop®. It allows you to easily and selectively sharpen the edges in an image.

What Is Sharpening?

Sharpening is a process which increases the perceived sharpness of an image and reduces the appearance of "softness." Most digital images require some form of sharpening for them to be displayed at their best. Softening is inherent in the process of digital capture, as well as the process of printing or displaying images. This softness can be combated by increasing the acutance of an image—the abruptness of transitions between light and dark. If you've ever wondered why professionally shot images look "crisper" than your own, chances are that good sharpening has something to do with it.

Sharpening is a complex topic, and a full treatment is far beyond the scope of this guide. Excellent references on the subject are available, such as *Real World Image Sharpening with Adobe Photoshop CS2*, by Bruce Fraser (published by Peachpit Press, 2006, ISBN 0-321-44991-6). For a full understanding of the role of sharpening in the digital imaging workflow, we recommend perusing a reference such as this one.

Traditional Sharpening Techniques

The most common tool for sharpening digital images is the misleadingly named *unsharp mask* filter. Internally, this filter works by subtracting a slightly blurred copy of the image from the original. Since the blurred image is most different in areas where the image brightness is changing, the difference represents the local variations in the image. By adding a portion of the difference back to the original image, these variations are emphasised, causing an apparent sharpening effect.

The unsharp mask is an effective tool, but indiscriminate application usually leads to poor results. This is because, in most images, sharpening is only really required in certain areas of an image. "Surface" areas of an image–those areas with only small-scale variation in brightness–usually require minimal sharpening. Areas of skin in portraits are a commonly cited example. Sharpening in such areas often results in images which appear "crunchy," and also exacerbates any noise or grain that is present. Sharpening is much more appropriate for the edge components in an image. These suffer most from the softening effects of the digital capture process, and sharpening the edges contributes most towards increasing the perceived sharpness of the image.

To accommodate this, a more sophisticated sharpening workflow usually employs edge masks to limit where the unsharp mask filter is applied. In Photoshop, the mask is usually created by applying the *Find Edges* filter to the image, blurring slightly and then inverting. While quite effective, the method is cumbersome. It suffers from lack of flexibility in determining which edges are represented in the mask, and is also tedious to perform.

How EasySharp Works

EasySharp provides a much more convenient and flexible approach to edge sharpening. It presents the edge selection and sharpening processes in a single filter, so there is no need to deal with a separate mask. Additionally, *EasySharp* offers control over the edge

selection process, allowing the strength of the edges to be chosen, rather than dictated by a separate edge-detection filter.

EasySharp uses an *edge-preserving blur filter* (technically known as a *bilateral filter*) to extract the edge components of an image. The bilateral filter is a non-linear extension of the Gaussian blur filter. It includes a measure of photometric similarity of adjacent pixels, meaning that nearby pixels of different brightness levels are not blurred together. The result of bilateral filtering is an image which is mostly blurred, but which retains sharp edges where they are present. An important feature of the bilateral filter is that it allows the degree of edge preservation to be varied, meaning that stronger or weaker edges can be preserved by changing a threshold parameter.

Once the bilateral filter has been applied to the image, the result is then sharpened using traditional sharpening techniques. This sharpened result is then recombined with the residual detail removed by the bilateral filter, producing a final image which has been sharpened only on the selected edges, leaving smoother areas of the image (those not extracted by the bilateral filter) completely untouched.

A further benefit of *EasySharp* is that it works internally in the Lab colour space, sharpening only the luminance channel of the image. This prevents the minor colour aberrations that can occur if sharpening is performed directly on RGB colour channels. Even for eight-bit images, the internal calculations are made in 16-bit mode, so degradation of the image due to colour space conversion is not a concern. The use of Lab colour is transparent to the user; the plug-in operates on images in most colour modes (including RGB, Lab, CMYK and monochrome).

2. Installing *EasySharp*

System Requirements

EasySharp requires Microsoft Windows® and Adobe Photoshop. It is compatible with Photoshop CS, CS2 and CS3, and may work with earlier versions. The algorithms used by *EasySharp* are more involved than those used for some other sharpening filters, so a fast CPU will be beneficial.

Installing the Plug-In

EasySharp is downloaded in the form of a zip file, `easysharp.zip`. The zip file contains a folder, entitled `Pixel Vistas`, with the following files:

- `EasySharp.8bf`, the binary for the filter;
- `EULA.txt`, a text file containing the end user license agreement;
- `copyright.txt`, a text file containing copyright notices; and
- `EasySharp-1-0-User-Guide.pdf`, this user guide in PDF format.

> **TO INSTALL *EASYSHARP***, simply extract the `Pixel Vistas` folder from the zip file into the Photoshop filter plug-in directory on your computer. This directory is typically:
>
> `C:\Program Files\Adobe\Adobe Photoshop CS2`
> `\Plug-Ins\Adobe Photoshop Only\Filters`
>
> To uninstall *EasySharp*, simply delete the `Pixel Vistas` folder .

Once the filter has been installed, Photoshop should be restarted. *EasySharp* will appear in the *Filters* menu under a *Pixel Vistas* sub-menu.

Purchasing and Installing a License Key

The *EasySharp* filter is initially configured to run in *evaluation mode*. Pixel Vistas offers the software under a thirty-day evaluation license, during which time the software is fully functional and you have the opportunity to evaluate its suitability for your purposes. While in evaluation mode, the software will present the dialog box shown in Figure 2.1 before each use. (This dialog box will also appear when first opening Photoshop after installing the plug-in.)
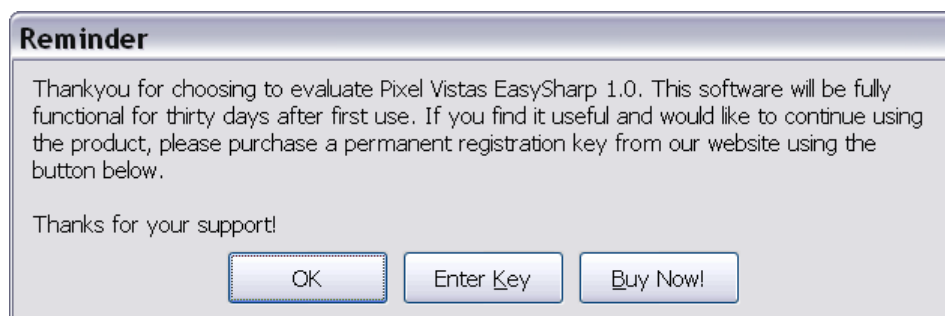

Figure 2.1. The *evaluation mode* dialog box is displayed during the evaluation period.

The *OK* button should be clicked to begin using the plug-in. The *Buy Now!* button provides a direct link to the Pixel Vistas website (`http://www.pixelvistas.com`), where a full license for the software may be purchased. Once you have purchased a registration key, press the *Enter Key* button to enter this key in the dialog box shown in Figure 2.2.

Figure 2.2. The *Enter Key* dialog box is used
to enter the registration key after purchase.

After you purchase a license for the software, copy the key directly from the purchase email you received and paste it into the *Key* field. In the *Name* field, enter your first and last names exactly as you entered them during the order process. A message will inform you of correct registration. After a valid license key has been entered, *EasySharp* is enabled for permanent operation, and the evaluation mode dialog box will no longer appear.

After the evaluation period has ended, a dialog box similar to Figure 2.1 will be displayed, but the software will no longer function. If you wish to continue use of the software, a registration key should be purchased. Otherwise, the software is easily removed from your computer by deleting the `Pixel Vistas` folder from the plug-ins directory.

Upgrading

Upgrades may be provided from time to time in order to fix any bugs which may arise and to provide additional features. Visit `http://www.pixelvistas.com/downloads.html` to check for the availability of upgrades. While we expect to provide minor upgrades free of charge, if we introduce significant new functionality to the software, we may require the purchase of a new or upgrade registration key.

3. Using *EasySharp*

Figure 3.1. The user interface for *EasySharp*, including a preview window on the left, a navigation window at top right, and various sliders controlling parameter values.

Overview

Figure 3.1 illustrates the user interface for *EasySharp*. The interface is easy to use and mostly self-explanatory. The main elements are:

- on the left side of the window, a preview window showing the effect of the filter;
- below the preview, a set of controls for zooming and toggling the preview;
- in the top right corner, a navigation pane showing the section of the image currently displayed in the preview; and
- in the bottom right corner, sliders controlling edge selection and sharpening.

Using the Preview Window and Navigation Pane

EasySharp's preview window operates in typical Photoshop fashion. Figure 3.2 shows the preview controls. These include *+* and - buttons for zooming in and out, a menu for selecting a specific zoom level and a *100%* button for switching directly to a *100%* zoom level.
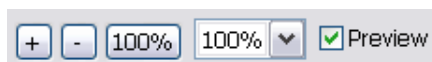

Figure 3.2. These buttons control the zoom level of the preview. The *Preview* check box toggles between the sharpened image and the original.

The zoom level may also be changed by clicking on the preview using keyboard shortcuts. Use ctrl-click to zoom in and ctrl-alt-click to zoom out.

You can scroll the preview window in several ways. Horizontal and vertical scrollbars are provided. The preview may also be moved directly by dragging it using the mouse. Finally, you can use the navigation pane to shift the preview window by clicking on the desired area. The dashed rectangle in the navigation pane illustrates the current location of the preview window.

A *Preview* check box is provided to toggle the preview on and off. When this box is unchecked, the preview window shows the original image. The original image is also displayed whenever the preview window or navigation pane is being dragged.

Selecting Edges

The *Select Edges* panel controls the selection of edges to which sharpening is applied. As the slider is moved from *less* to *more*, the sharpening effect will be applied to more and weaker edges in the image. At the right end of the scale, only the most prominent edges in the image will be sharpened; conversely, at the left end, even fairly minor edges are affected. Your task is to set this control so as to distinguish between perceptually significant and insignificant edges. If the slider is set too low, the sharpening affect will be applied to undesirably minor variations in the image, possibly even to image noise. If it is set too high, the overall sharpening effect will be insufficient as very few edges are sharpened. Somewhere in between, you should be able to find a happy medium.
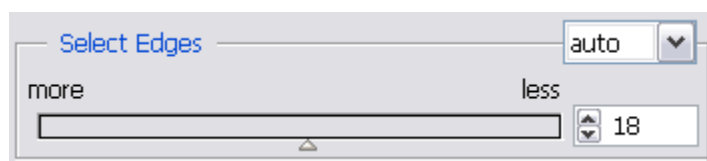

Figure 3.3. The *Select Edge* slider controls the
degree to which edges are subject to sharpening.

The top right corner of the panel contains a pop-up menu, allowing you to select an automatic setting for the *Select Edges* slider. There are three automatic settings: *auto*, *auto (less)* and *auto (more)*. These options attempt to consistently select a certain degree of edges by analysing the image content. (Specifically, they do so by examining the distribution of the image's gradient norm, a measure of the degree of variation between adjacent pixels in the image.) The *auto* option selects a medium amount of edges from the image; the *auto (less)* and *auto (more)* options choose lesser and greater degrees of edges, respectively. When you select an *auto* option, the corresponding value will be set on the slider; the values will vary according to the content of the image. If you subsequently adjust the slider by hand, the pop-up menu will revert to *manual*.

You can easily visualise the effect of the *Select Edges* slider using the *Edges* check box, as illustrated in Figure 3.4. This check box toggles the preview window between the normal preview and a "show edges" mode. In this mode, the image is displayed in monochrome and a coloured overlay indicates the edges which are currently selected and subject to sharpening. As the *Select Edges* slider is adjusted, the coloured overlay will change accordingly. Additionally, clicking on the small coloured box at the bottom right corner of the preview allows the overlay colour to be switched between red, green and blue according to preference.

Figure 3.4. The *Edges* check box toggles between the normal preview and a preview of the currently selected edges. A coloured mask indicates the edges.

Sharpening Edges

The *Sharpen Edges* panel contains the main controls for applying sharpening. The *Radius* and *Amount* sliders mirror the controls available with Photoshop's unsharp mask. *Radius* controls the region of influence of the sharpening operation, and you should set them differently depending on the destination and original resolution of the image. *Amount* controls the strength of the sharpening applied. You can make fine adjustments to the slider values using the up and down arrows on each slider, and also by entering a value directly using the keyboard.

Figure 3.5. The *Sharpen Edges* sliders control the sharpening which is applied to the selected edges.

The *Lightness* slider is an additional control which is not available in unsharp mask. The slider biases the sharpening effect between light and dark sides of edges. As the slider is moved from *lighter* to *darker*, the sharpening effect is applied more to the darker side of the edges and less to the lighter side. (The overall effect on the image is also to make it appear slightly darker.) The Lightness slider may be useful to reduce the excessive

visibility of "halos" which can occur on exceedingly sharp edges such as horizon lines. Its default value is set to -35%, a value which approximates the result achieved using Photoshop's unsharp mask with the same parameters.

As sharpening parameters are adjusted, the preview window will show the effects of the adjustment. You can evaluate the overall effect of the sharpening at 100% zoom level, or in more detail by using one of the higher magnifications.

How to Use EasySharp *in the Workflow*

EasySharp may be used wherever the unsharp mask is usually applied. For beginner and intermediate photographers, *EasySharp* represents an easy way to obtain improved sharpening results with no extra effort. If your usual habit is to run the unsharp mask filter over an image once before printing or posting, you can use *EasySharp* in the same capacity and with the same amount of effort, and achieve improved results.

For more discerning photographers, *EasySharp* can take the place of edge masks in a multi-pass sharpening workflow. Such a workflow typically includes separate, deterministic source- and output-specific sharpening steps, as well as an intervening, content-specific sharpening step. In the latter step, the photographer applies sharpening subjectively according to the character of the image, usually with the help of an edge mask. *EasySharp* can take the place of edge masks in this situation, simplifying the process significantly.

In order to apply *EasySharp* selectively to an image, you can use one of the many excellent tools available in Photoshop. The following tools are useful for selectively modifying the effect of *EasySharp*; we recommend you become acquainted with them:

- The *Fade...* command. This command allows you to over-apply the filter and then throttle back its effect to fine-tune the overall result.

- The *History Brush*. With this tool, you can "paint" over areas of the filtered image at varying opacities to partially revert those areas.

- Selection tools. The effect of *EasySharp* can be restricted to a given area by the use of a selection. Many useful selection tools are available, including *Color Range*, the various *Lasso* tools and the *Magic Wand*. These selection tools can either be used before applying *EasySharp*, or to a layer mask after filtering.

- Duplicate layers and layer masks. We recommend applying sharpening to a duplicate layer, rather than the original image. This offers several advantages, including the ability to create a layer mask. By painting the mask, the original image underneath can be selectively blended with the filtered image.

- Blending options. When *EasySharp* is applied to a duplicate layer, the *Layer Style* menu option may be used to adjust the blending of the layer with the original layer beneath it. In particular, the *Blend If* sliders are very useful for excluding the shadow and highlight areas from the sharpening process.

- Smart filter layers. In Photoshop CS3, *EasySharp* may be applied to a "smart object" as a layer, in much the same way as an adjustment layer, allowing later alteration of the filter parameters. *EasySharp* is a natural match for smart filter layers, since they allow you to add a sharpening step without committing to the parameter values. Since the degree of edge selection is encoded in the plug-in's parameters, using *EasySharp* as a smart filter allows you to change the amount of edge selection (as well as the sharpening amount and radius) at a later date.

Refer to the Photoshop documentation, and to other references such as the book cited in chapter 1, for more information on the use of these tools.

Automating EasySharp

EasySharp may be used in an automated image-processing workflow (for example, when batch-processing images for web publication). The *auto* edge selection modes, described earlier in this chapter, were designed primarily with automation in mind. These modes allow a consistent level of edge sharpening to be applied without manual intervention. This is important for use in an automated process, since different types of images require different *Select Edges* parameters to produce the same result.

EasySharp may be automated either through the use of actions or through scripting. When recording an action with *EasySharp*, the parameter values used by the plug-in will be indicated in the actions palette, including the *auto* edge selection mode, if used. Be sure to select one of the three *auto* modes if you intend to use the action without user interaction. (Note that the *auto* modes only affect the *Select Edges* parameter; the sharpening radius and amount are not affected and should be set to the desired values when recording the action.)

When using *EasySharp* within a script, the *Script Listener* should be used to obtain the scripting interface for the plug-in.

4. Other Topics

Frequently Asked Questions

1. **What are the system requirements?** *EasySharp* requires Microsoft Windows and Adobe Photoshop. A fast CPU is also beneficial.

2. **Is there a Macintosh version?** No, not yet. However, if the product proves popular, we would like to port the code to Mac.

3. **What version of Photoshop is required?** *EasySharp* has been tested with Photoshop CS, CS2 and CS3.

4. **Can I use EasySharp with Photoshop Elements?** Yes, if you have a recent version. *EasySharp* is compatible with Photoshop Elements 5.0, at least.

5. **How large is the plug-in?** *EasySharp* requires about 2.0Mb of disk space.

6. **What image modes are supported?** *EasySharp* works with both 8- and 16-bit images, and supports RGB, grayscale, Lab, and CMYK colour modes.

7. **Can I record actions with EasySharp? Can I use it as a smart filter?** Yes, *EasySharp* is fully scriptable, and is compatible with the "smart filter" feature available in Photoshop CS3.

8. **How can I stay informed about upgrades?** Product upgrades will be announced on the news page (`http://www.pixelvistas.com/news.html`). We don't keep an email list; instead, we have a news feed which is our official channel for announcements. You can subscribe to the feed using your news aggregator of choice. Alternately, if you would like email notification of product updates and news, try a feed-to-email site such as `rssfwd.com`, `feedblitz.com` or `squeet.com`.

Contacting Pixel Vistas

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