Smart Refinement Filter

Adobe Photoshop® plug-in

User's Guide

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Introduction

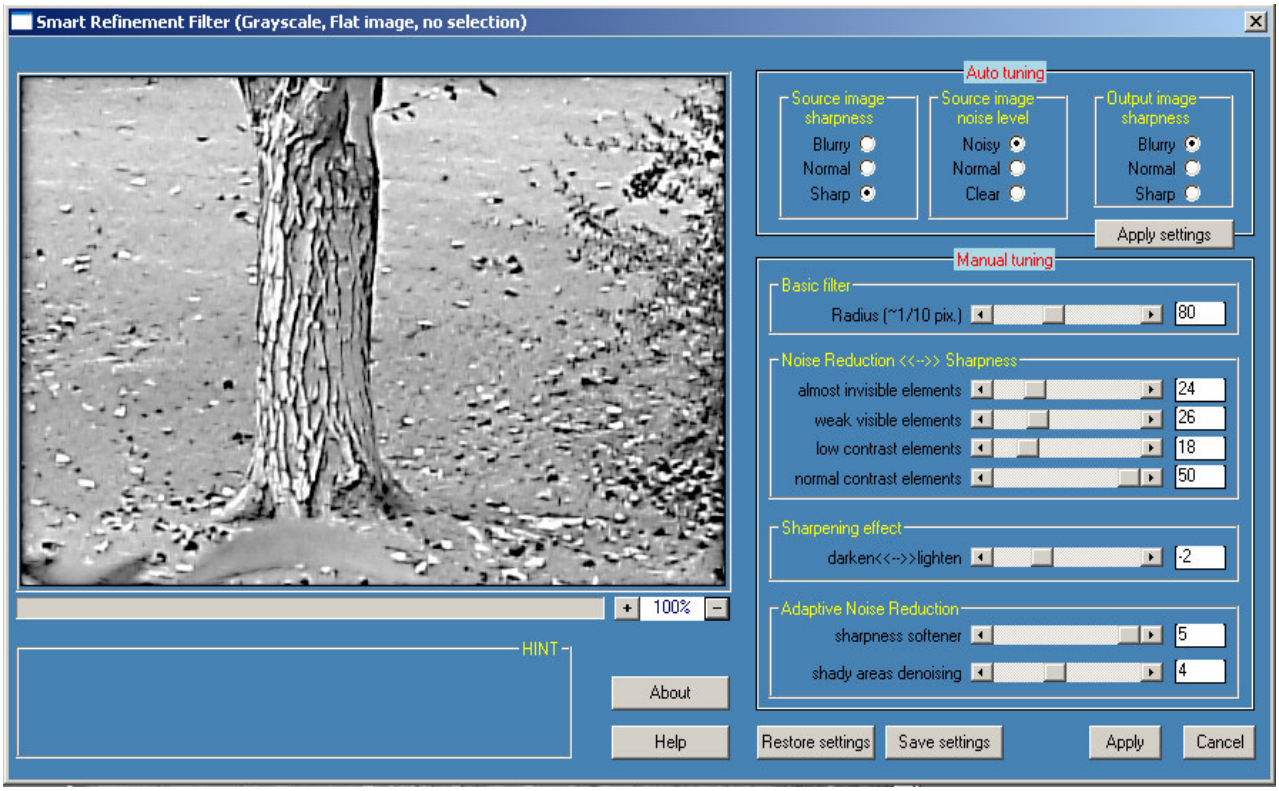
Smart Refinement Filter is an Adobe Photoshop® plug-in for photographic images enhancement.
This plug-in allows: sharpness and depth-of-field (DOF) enhancement, and noise (dust) reduction.
Basic features are:

- Both: sharpness enhancement and noise reduction are associated together into the single plug-in. That simplifies an optimal result achievement, since usually a sharpness addition cause to noise boosting and vice versa - a noise reduction may cause to burring.
- The sharpness control is a multi-band. It allows separate adjustment of:
  - almost invisible elements,
  - weak visible elements,
  - low contrast elements,
  - normal contrast elements
- The noise reduction is adaptive, that means it's automatically fitting to each local image region. I.e. the noise reduction of Smart Refinement Filter is a content-dependant. User is only required to tune the average influence levels for:
  - sharpness softening
  - shady areas noise suppression
- Automatic adjustment. As an alternative to manual tuning a user may simply define the source image quality and the desired output image sharpness, and whole parameters will be tuned automatically.

Technical specs

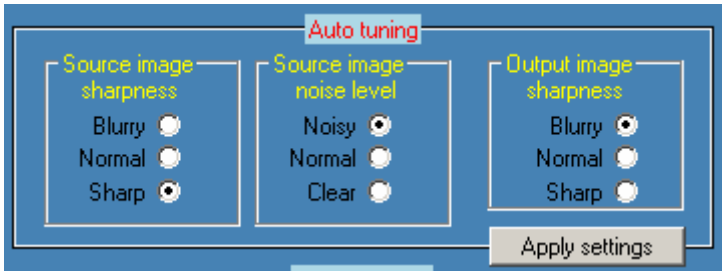
OS	MS Windows® XP (other OS compatibility will be tested in a future)
Host application	Adobe Photoshop ® CS2, CS3 (other host applications compatibility will be tested in a future)
Input acceptable format	Single channel grayscale image (typically Y channel)
Output format	Same as input
Basic filter	Gaussian shape, tunable radius: approx. 0.2..20 pix.
OVO ® channels	4
Other	• Auto-tuning; • Sharpening effect; • Adaptive noise reduction: sharpness softener, shady areas de-noising; • Save/Restore user's settings

Operating manual



Two basic modes are available: Auto tuning and Manual tuning modes. Both may be used concurrently.

Auto tuning



The usage of Auto tuning is a practical solution for those who have no much time (or knowledge) to play with separate parameters.

The Auto tuning controls are divided on three groups:

- Source image sharpness,

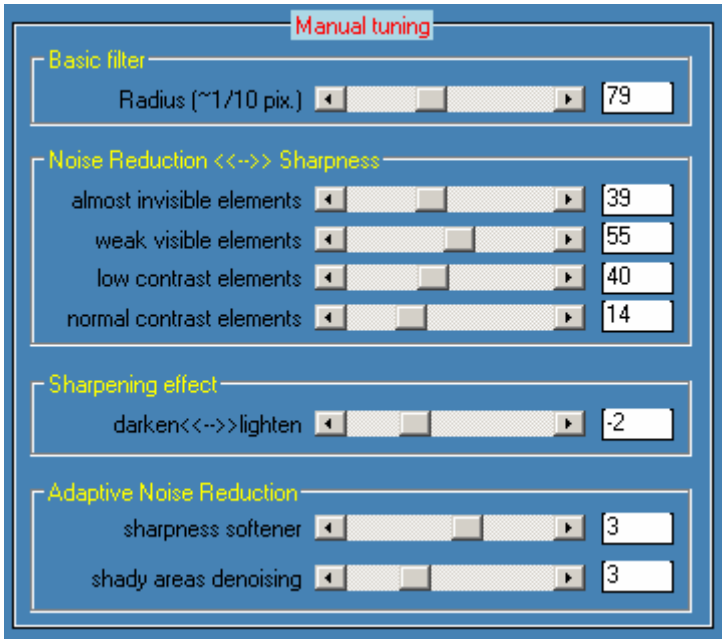
- Source image noise level,
- Output image sharpness.

One of three possible parameters within each group has to be defined in order to allow to Smart Refinement Filter make automatic presets correctly.

Pressing the Apply settings button is visibly affected on Manual tuning controls: appropriate sliders are automatically shifted in accordance to Auto tuning settings, and the processing is applied to the Preview screen.

Thus on the one hand most parameters are adjusted automatically, on the other hand the user is able to keep track and correct (if needed) of the parameters in order to achieve a best result.

Manual tuning



Basic filter

This control allows defining the window size of the basic (de-noising / sharpening) filter. The value is similar to the Photoshop® Unsharp mask filter radius parameter.

The control provides a possibility to choose the size of image details to which the processing has been applied. Smaller radius is corresponding to smaller details, and higher radius – to larger ones.

Noise Reduction <<->> Sharpness

This is a group of four control sliders which allow tuning the gain (contrast) of particular image elements. Each slider corresponds to its own image elements groups in accordance to their visibility level, i.e contrast. A smaller value means less gain, and vice-versa:

- almost invisible elements. A small value (less then ~10) is softening the image and in some cases suppressing noise. Higher values (above ~20) are usable to DOF increase, but have to be used carefully since it may significantly increase noise level.
- weak visible elements. A small value (less then ~8) is softening the image and in some cases suppressing noise. Higher values (above ~16) are usable to DOF increase, but it has to be used carefully since it may increase noise.
- low contrast elements. A small value (less then ~6) is softening the image. Higher values (above ~12) are usable to DOF increase, but it has to be used carefully since it may cause glaring effect.
- normal contrast elements. A small value (less then ~5) is softening the image. Higher values (above ~10) are usable to DOF increase, but it has to be used carefully since it may cause glaring effect.

Sharpening effect

Darken <<->> lighten.

This effect allows tuning the sharpening tendency – slider's negative value makes the small image details look darken, and positive values make it lighten.

Adaptive Noise Reduction

This group of sliders is intended to the noise reduction tuning (slider's zero values are disabling an appropriate feature:

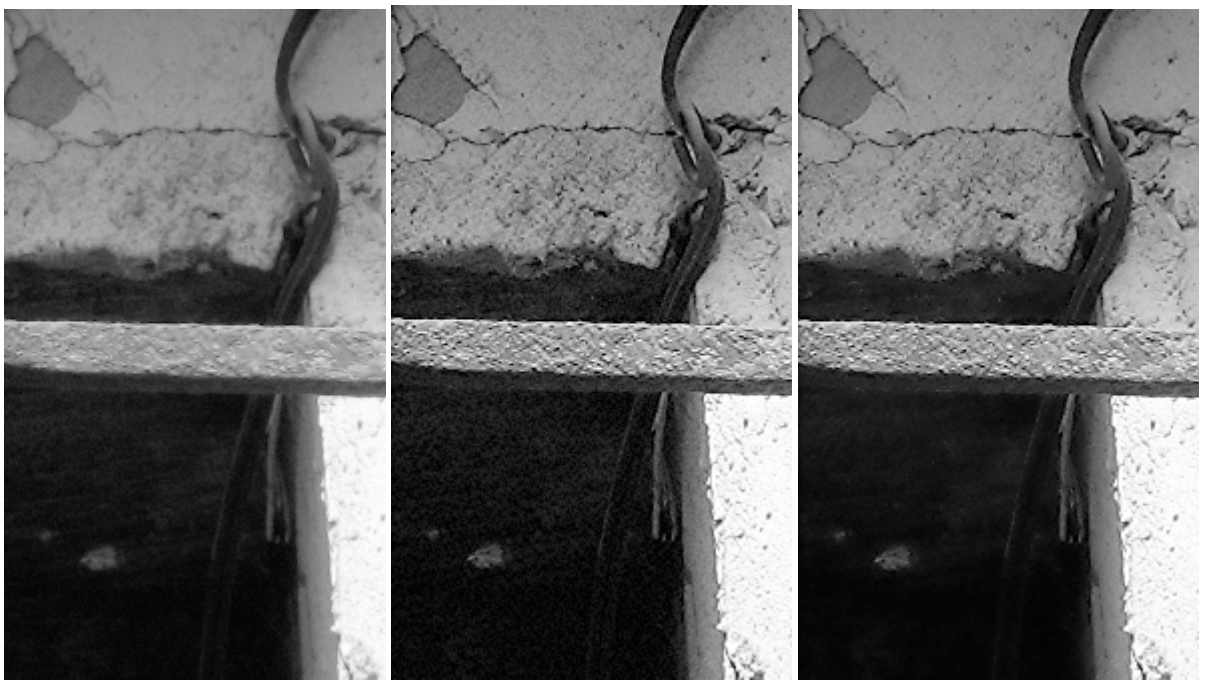
- sharpness softener control allows tuning image details softening level that is especially usable in case of applying significant sharpness level which may cause the glare and "hot spots" effects, a visibility of scratches and sparkles-like noise as illustrated on following example:

Source image

Processed image with sharpness softener = 0

Processed image with sharpness softener = 3

- shady areas denoising control allows tuning the adaptation to a local brightness level parameter of the noise reduction algorithm as illustrated on following example:



Source image

Processed image with shady areas denoising = 0

Processed image with shady areas denoising = 8

Other user controls

Button	Description
Cancel	closes the filter window with no applying the processing to an image
Apply	closes the filter window and applying the processing to an image
Save settings	saves all sliders (except zoom) position in Settings.ini file
Restore settings	restores all sliders (except zoom) position from Settings.ini file
About	shows the About dialog window
Help	shows this online document on www.auralabs.com web site

Installation

1) Copy SRF.8bf file to …\Adobe Photoshop\Plug-Ins\Filters directory
2) Run (or rerun) Adobe Photoshop®