
AcceleratedVision
SHARPEN
- Sharpness area
- Supersampling area
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HDR
NEAT
DENOISE
FOCUS
LUT
COLOR
ZOOM
BLACK & WHITE
EMOTION
ANALOG
DIVE
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Guide to the special functions of the programmes

SHARPEN

Sharp isn't everything, but without sharpening everything is nothing!
Sharpening is the last and most important step in any image editing process, because sharpness and blurriness literally catch the eye of the viewer and have a significant impact on the overall impression**.**
SHARPEN takes the art of sharpening to a new level and guarantees razor-sharp photos, when blurring should not be used as a stylistic device.
SHARPEN adapts the sharpening to your subjects and sharpens the eyes differently to the skin in a portrait, for example. Camera shake is analysed and converted differently to a macro shot. In conjunction with the **quality modes** for blurring reduction and several quality levels in **supersampling** (method for improving the quality of sharpening), this leads to unique, very homogeneous and natural-looking results.

Of course, neural networks and AI play an important role and are used where it makes sense and achieves better results.

The **visualisation** of the **blurring before/after** impressively illustrates the sharpening and makes it easier to select different presets.

Another strength of this software is the decision selection: You can watch the automatic system suggest brilliantly sharp images in the best possible image quality, or you can use the sharpening options to get an image optimised to your own personal taste in sharpness:

These options make **SHARPEN** the ideal companion for professional photographers, ambitious 'hobby photographers' or the majority of photographers who want to take 'beautiful', significant pictures for themselves, relatives and friends quickly and easily.

This guide describes the modules with the **core competences of the SHARPEN programme** that make this software unique and set it apart from others:

- **The sharpening area with automatic sharpening and numerous individual influence options.**
- **The supersampling area, which finally calculates the sharpened image in the details and contours even more finely and precisely, thus creating an optimal result image that inspires the user.**

To begin with, the **flash workflow** shows that you can achieve a finished and impressive result in three to four steps if you rely on the automatic system and do not want to intervene manually.

Note: The cross-programme modules and functions, such as Finalise or Expert mode. RAW module or basic functions of the presets and others can be found in the corresponding guides.

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1. FLash workflow - quickly to the finished image

The **Flash workflow** takes particular account of the changes in photography. In addition to professional photographers and ambitious 'hobby photographers' with professional equipment, most people today photograph unforgettable moments or 'normal' life situations with children, grandchildren or sights, celebrations such as weddings with their mobile phones or simpler system cameras.

Spontaneous snapshots of unusual or funny subjects have their price - the **sharpness of the image** - because, for example, the subject was too fast or the hand was not steady enough.

Despite all the differences, the desire for the resulting image is the same: **it should be optimally sharpened**.

If you want to do it quickly and automatically, you can do it in **3 steps**:

Step 1: **File import**: Load the desired image file into the programme window (**1**).

Step 2: Accept all presets with the default **preset Original** (**2**), then this step is omitted.

Step 3: **Optional**: Select a category other than the preset category (**3**). If you accept the preset, this step is also omitted.

Step 4: Trigger automatic mode by clicking on **Set automatically** (**4**).

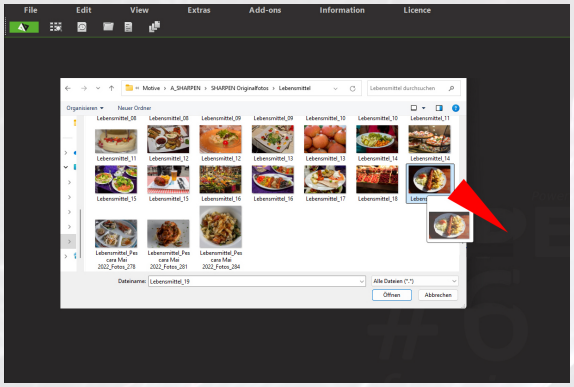
Step 5: **Save** or select one of the image cropping/scaling suggestions beforehand - **done**!

In most cases, you will achieve very good results with these 'quick steps'.

Note: The steps listed in the flash workflow are described in detail in the **General files guide**.

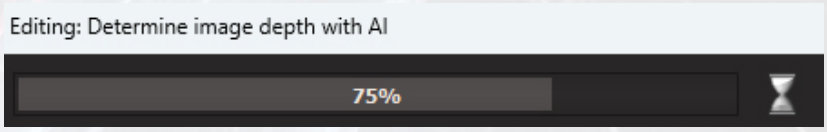
The individual steps or **special features for SHARPEN** are listed here in abbreviated form and are described in detail in the following chapters.

Step 1: File import

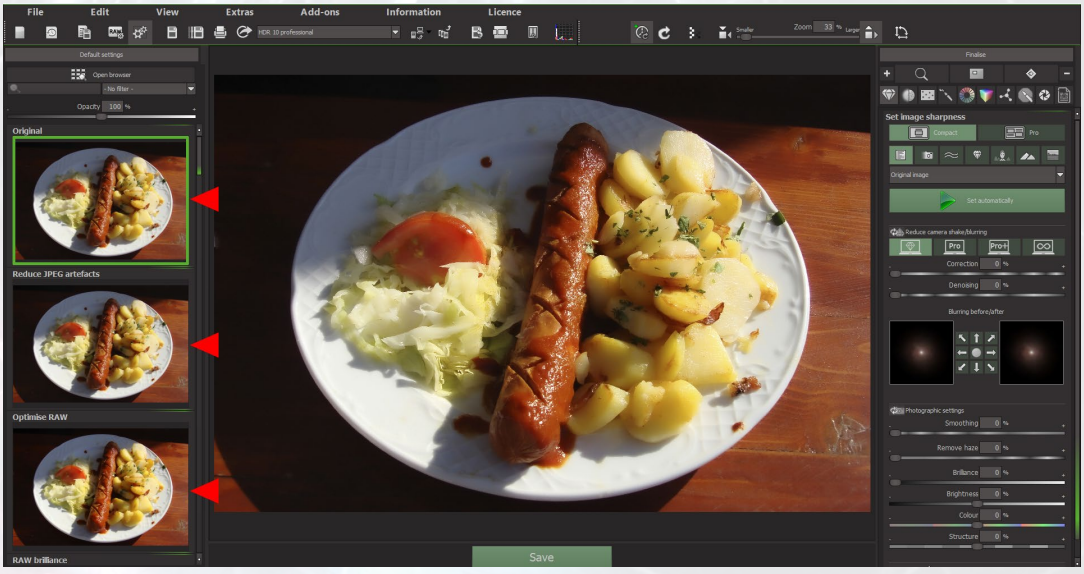


There are various ways to load an image, e.g. via File/load image, all of which are equivalent. You decide which method is quickest or easiest for you.

Drag & drop: With the method selected in the example, simply **drag & drop** the image file into the programme window. To do this, select the desired image in Explorer and drag it into the programme window by holding down the left mouse button.



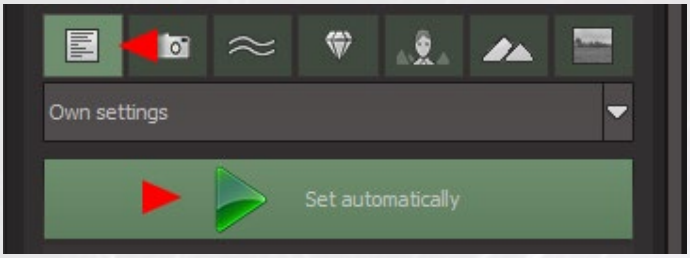
The note **Determine image depth with AI** that then appears refers to the fact that SHARPEN determines a depth map for each image, which is explained in the chapter **Protect image areas with 3D variants.**



In contrast to the other Accelerated Vision programmes, you will **not see the resulting image seconds later, but the unchanged original, because in SHARPEN the presets only prepare the sharpening options, but do not sharpen them themselves.**

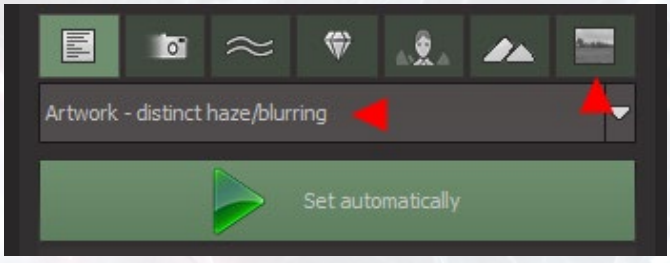
If you have specified a folder for the individual images in the Extras/Settings/**Programme** menu, this folder is always selected automatically.

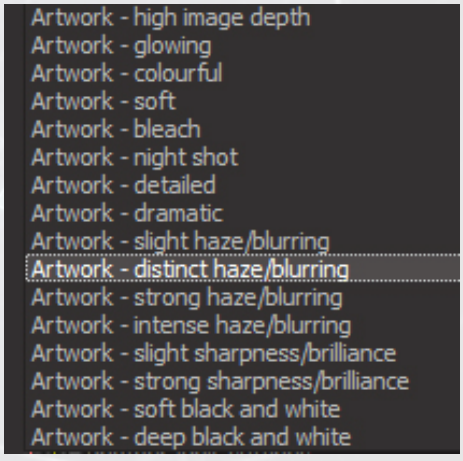
Step 2: **Activate automatic**



Click on the green **Set automatically** button to let the automatic programme select the appropriate category and presetting for any blurring and blurring that may be present in the image.

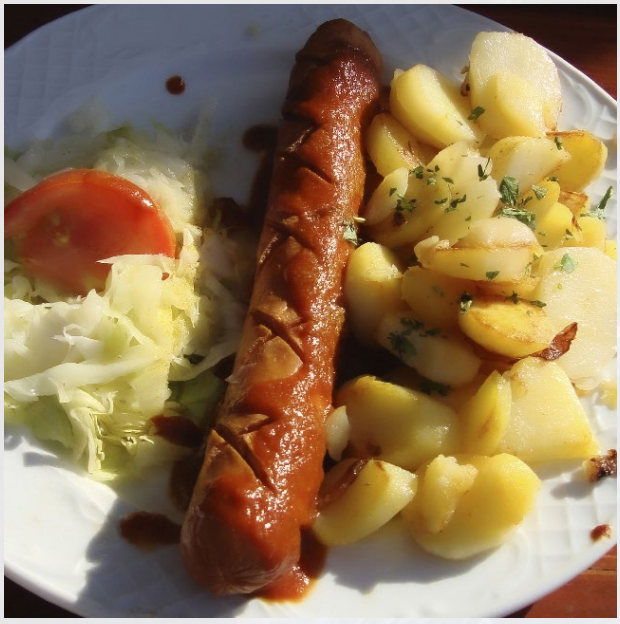
As a rule, the last category **Artwork** is selected and in this category the appropriate preset for the analysed motif, in the example **district haze/blurring**.

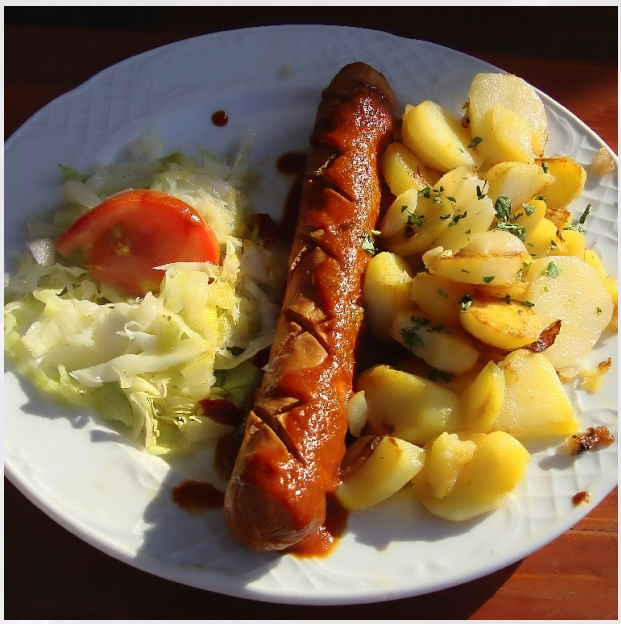




If you would like to 'override' the automatic system with a slight or stronger correction, click on this button or the small arrow next to it and select one of the presets shown for this category or all others (see the **Categories** chapter) that corresponds more to your personal preferences, which was not necessary in the example.

Before - After - Comparison

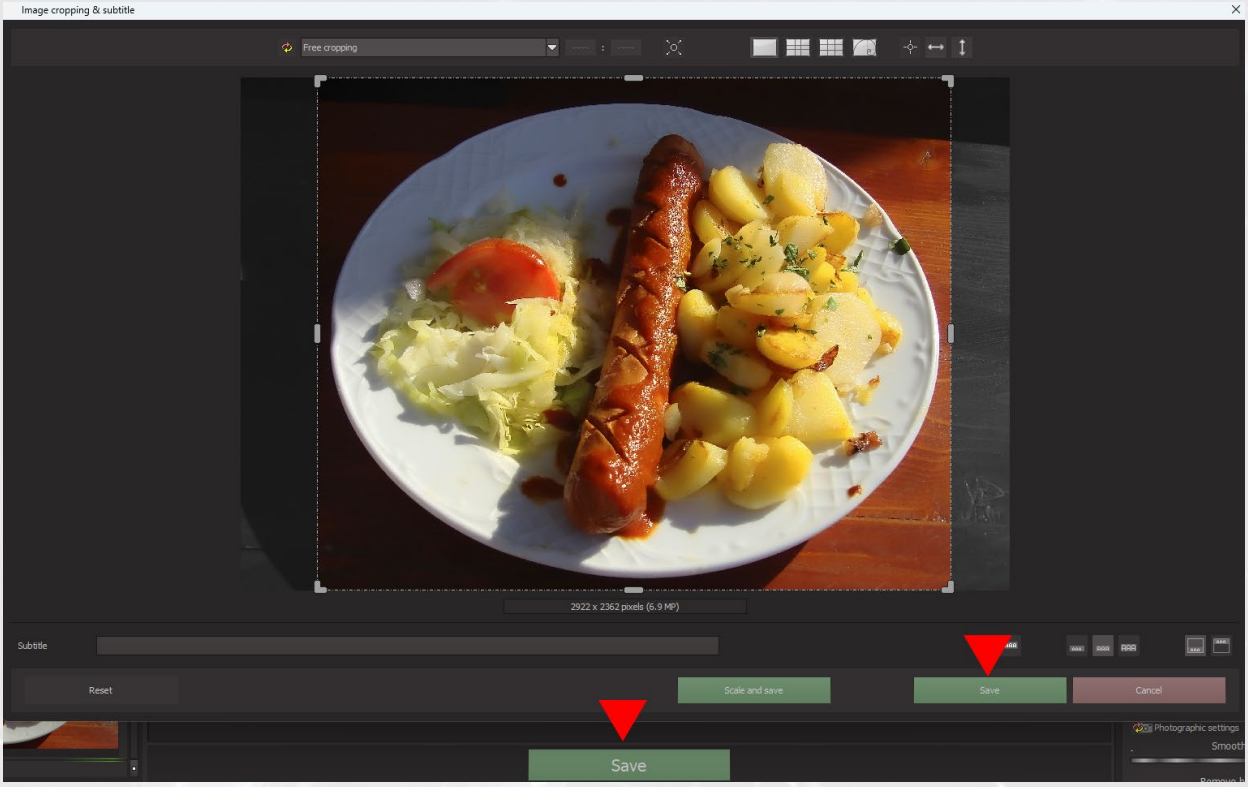




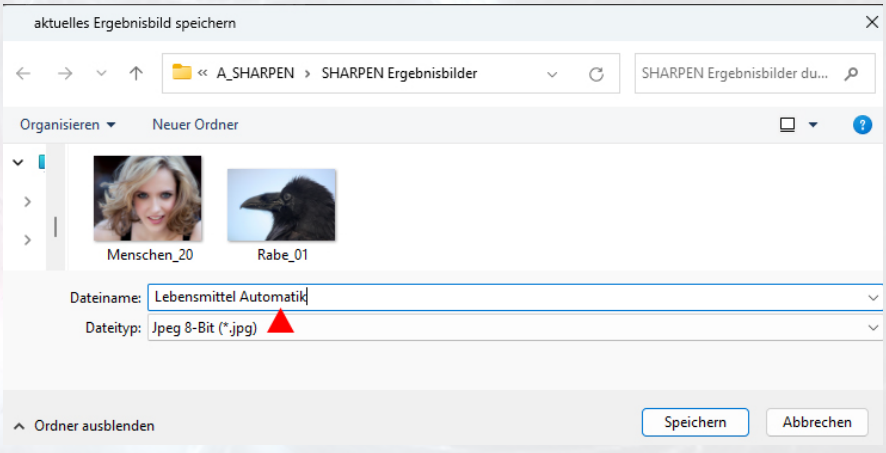
The before and after comparison shows that the automatic system has done a great job in analysing and sharpening the snapshot:

The resulting image (graphics on the right) has the desired ‘correct’ sharpness corresponding to reality, the currywurst looks ‘crispier, the fried potatoes appear crispier, and everything looks more present and appetising.
The combination of **district haze/blurring** leads to simultaneous sharpening and slightly more intense colours. If haze is reduced in an image, it becomes darker and the colours, e.g. those of the sky, more intense. Increasing the brightness counteracts the generally undesirable darkening, which is automatically applied in the **Photographic settings** area in **SHARPEN**. In the example, the stronger intensity of the colours is desired.

Step 3: **Save** or select one of the image cropping/scaling suggestions beforehand - **done**!

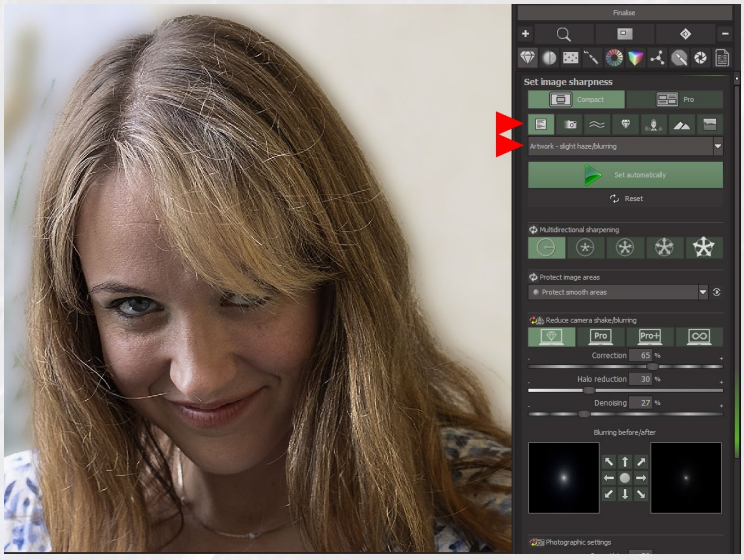


Click on the **green Save button** to automatically switch to the **Image cropping and subtitle** window. Here you are offered further options such as **customised image cropping, title input** or, by clicking on **Scale and save**, scaling presets, e.g. for **social media formats** such as Facebook, Instagram or Twitter, which you can use if required.
If you decide in favour of these offers or are satisfied with the resulting image without further intervention, click on the **second green Save button** to switch to the selected folder ...



... and either accept the file name or assign a ‘descriptive’ one, which makes it easier to find your way around later.

Image example 2: Selection of a different category



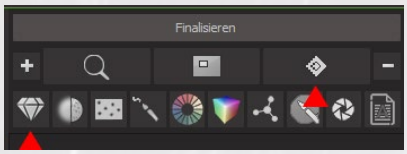
In the first image example with a direct click on **Set automatically**, the more intense colours were welcome in addition to the sharpening. This is not desirable for all subjects, e.g. for many portraits as in this 2nd image example.

In addition to the **Portrait category** with its customised presets, the **second category, Camera shake and blurring**, can be the first choice for many subjects.

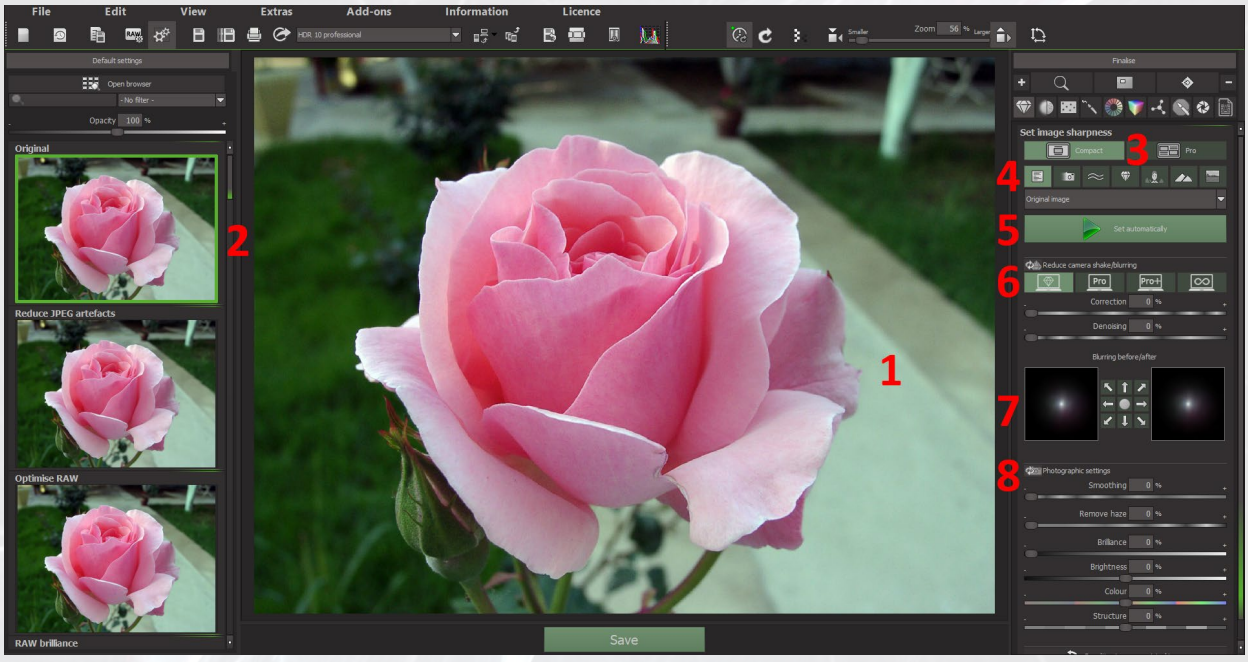
Here it is worth selecting a different category, in many cases the most frequently used flash workflow, as step 3 before immediately triggering the automatic function.

After clicking again on **Set automatically**, you will see a very good result that preserves the smooth skin structures, sharpens the hair, eyes and lips more and leaves the colours unchanged.
Save with the corresponding options is identical to the first flash workflow.

2. Interface overview with sharpness area and presets



After loading an image file and clicking on the **diamond symbol** in the toolbar...

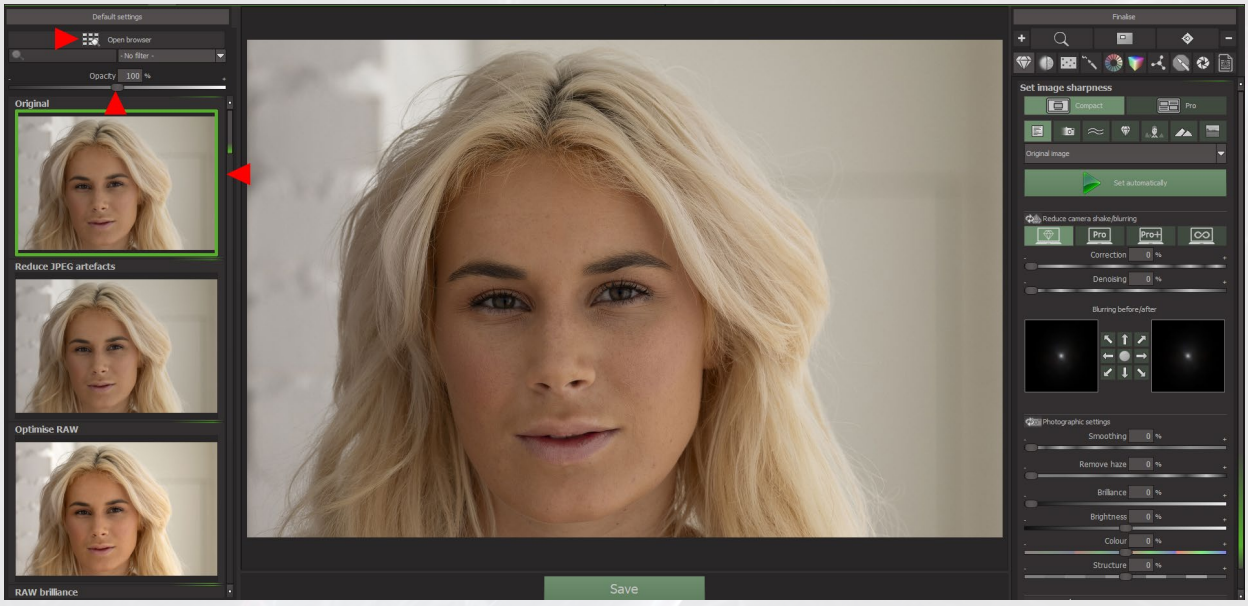


... you can see the user interface with the **sharpness area** displayed. If required, the **supersampling area** can be displayed by clicking on the button next to the minus sign for finalising.

1. The familiar programme window with the **unsharpened original**.
2. On the left are the **presets**, which themselves do not sharpen, but **prepare the various sharpening options**.
3. **Compact interface mode** (standard), which displays the main modules and parameters for the image sharpening settings, and **Professional mode**, in which **all** setting options are displayed. This mode is described in more detail in the **Professional mode chapter**.
4. **Sharpness categories** with the corresponding presets.
5. **Automatic camera shake and blurring**. **After activating the automatic mode by clicking on it, further modules are displayed**.
6. **Quality modes** for blurring reduction.
7. **Visualisation of the blur distribution in the image**.
8. **Photographic settings** depending on the different sharpening methods.

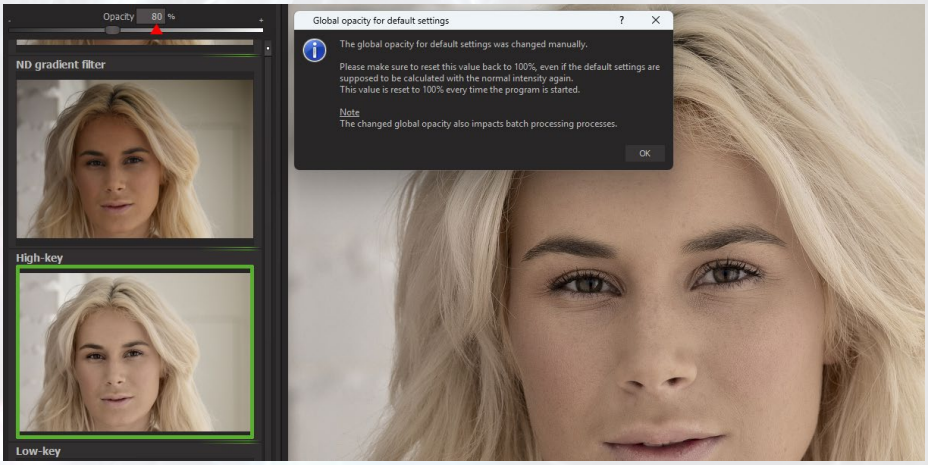
Note: The presets, modules or categories are described in the following chapters.

3. Importance of the presets



The **presets** in **SHARPEN** are not presets that offer different sharpening options. In contrast to most other programmes from Accelerated Vision that offer different image looks or image moods in several categories to choose from, the presets in **SHARPEN** are preparatory presets with different image look variations or corrections such as 'Reduce JPG artefacts' that do not offer **different levels of sharpening**. The selected preset is outlined in green and is the template for all sharpening options on the right-hand side of the programme.

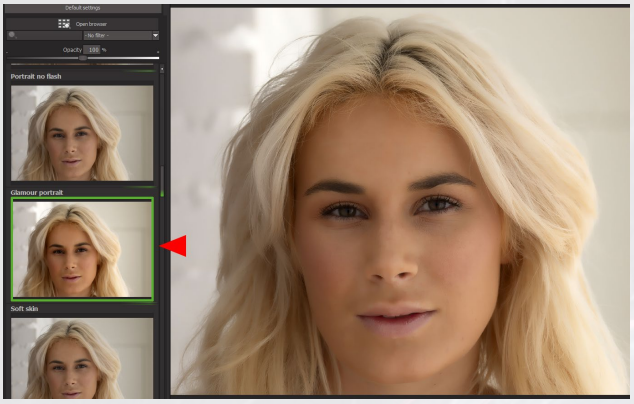
Browser: If required, you can see a quick overview of all presets or presettings by clicking on the browser icon in the Variant browser window. As a rule, you can simply accept the preset 'Original'.



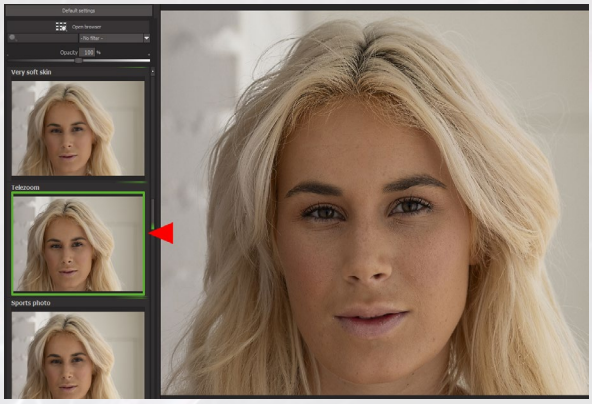
Change opacity: The opacity of a preset is set to **100%** by default. You can use the slider to reduce the effect of a preset to **80%** to 0% (original) or increase it to 200%, as in the **High Key example**.

The window that appears indicates that the change must be reset if the presets are to be calculated with normal strength again, which happens automatically each time the programme is started.

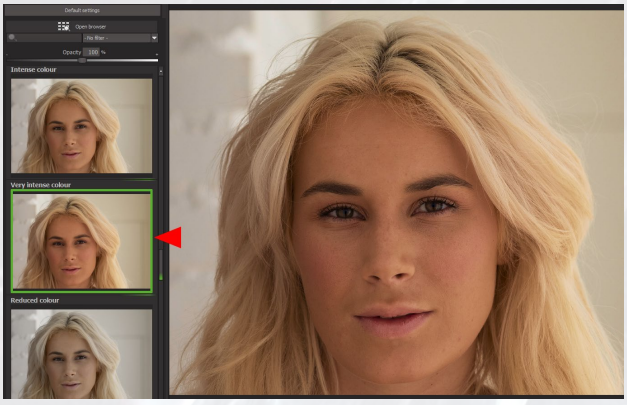
Adjust preset variations and sharpening, Reset



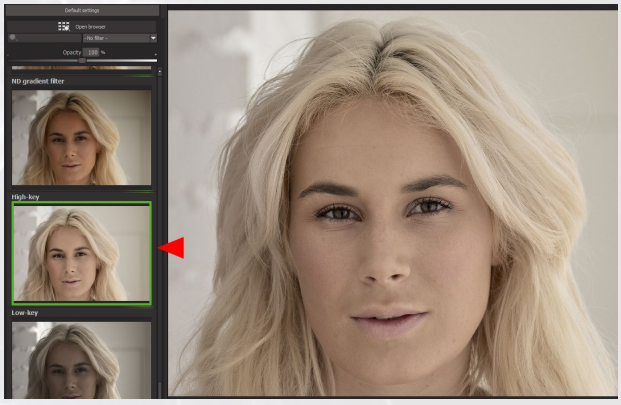
Glamour Portrait



Telezoom

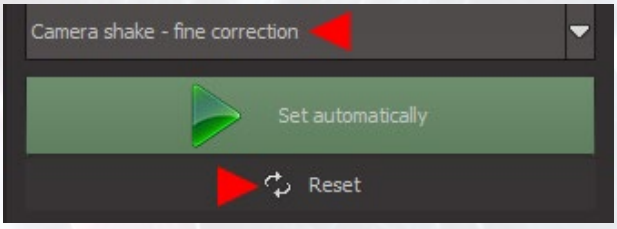


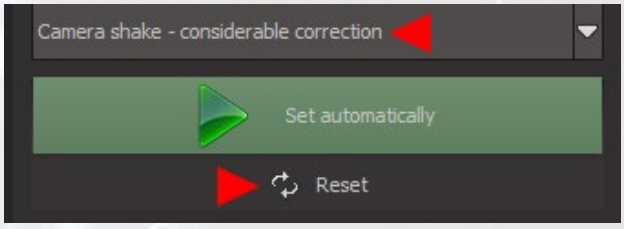
Very intense colour



High - key

The graphics show that the presets offer very different image looks. As the sharpness options with the resulting images are always related to the selected preset, it is worth trying them out for many subjects.



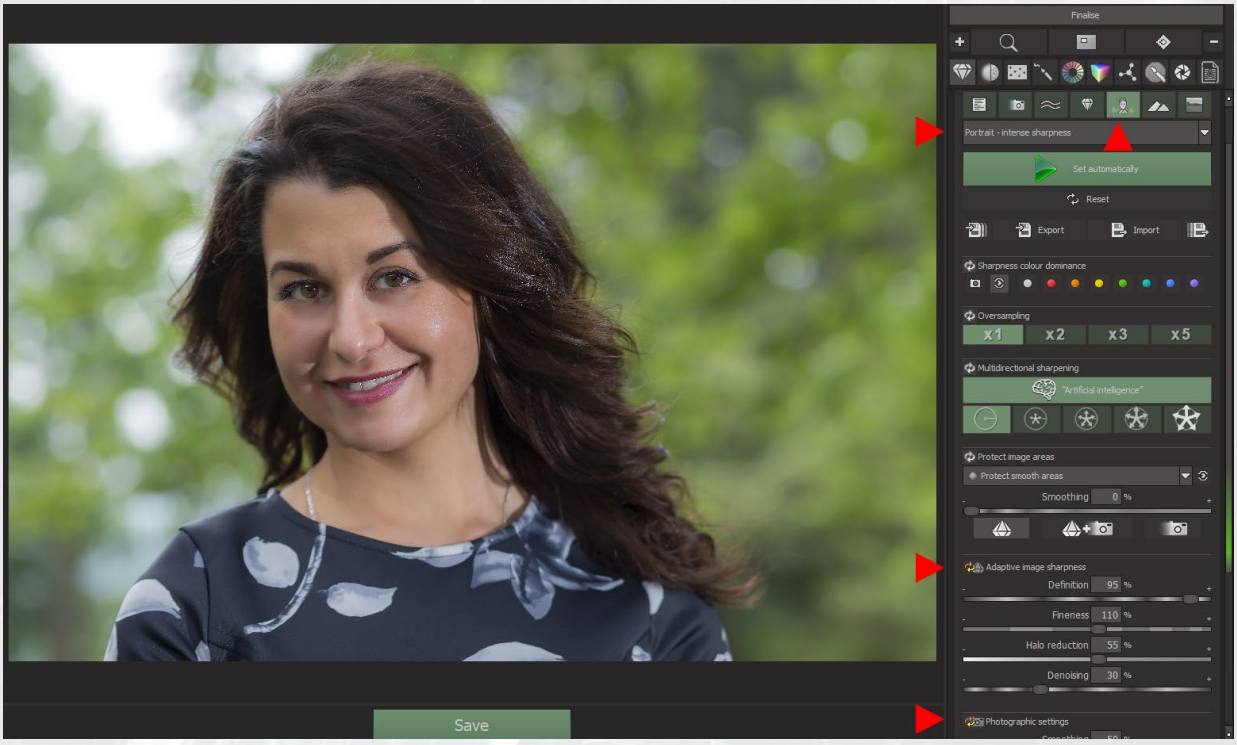


Reset sharpness settings: If you only scroll through the presets after sharpening, only the image look changes; the sharpness settings remain the same as the originally selected preset.

Clicking the **Reset button** resets all sharpness settings to the default values. Clicking **Set Automatically** again triggers the sharpening of the currently selected preset again, which can also lead to other sharpening presets, such as in the example **Camera shake – fine correction** for the **High Key preset** to **Camera shake - considerable correction** for the **Glamour Portrait preset**.

4. 7 sharpening categories, 3 different sharpening methods

If you want to 'override' the automatic system, you have the choice between **three different sharpening methods** in **7 categories**, which adapt the sharpening even more specifically to the loaded subject.



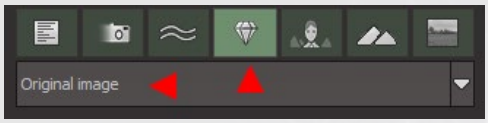
Example: With the standard preset **Original** in the **Portrait** sharpness category, **SHARPEN** analyses the differences in a portrait even more precisely and sharpens only where it makes sense with the help of **adaptive sharpness**. However, this **intensive sharpness** is not applied to the entire image: The result is a **differentiated, sharpened image** without colour change with discreetly sharpened skin and stronger sharpening of the eyes, lips and hair with more details, which is very pleasant and convincing.

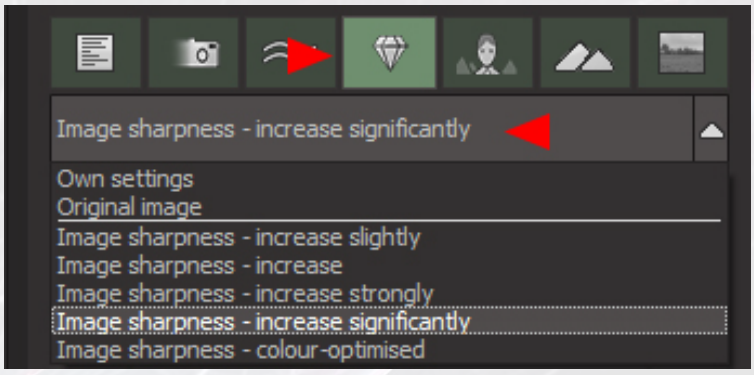
The parameters belonging to each **image sharpness category**, such as **Adaptive image sharpness** and **Photographic settings** in the example, are also adapted to the different sharpening methods and, together with the other options, enable the optimum results to be achieved that are completely customised and tailored to personal taste.

However, personal taste also means that not every viewer will like the selected sharpness of the sample images shown in the same way. **SHARPEN** makes it easy for you to approach your personal taste intuitively and live until the entire image statement is 'right' for you. The different sharpening methods, the associated image sharpness categories and all other individual intervention options are explained in more detail below.

Note: If you **'override'** the automatically suggested preset by clicking on another preset, **this preset is immediately recalculated**. Click on **Set automatically again to change the preset back to the original one**.

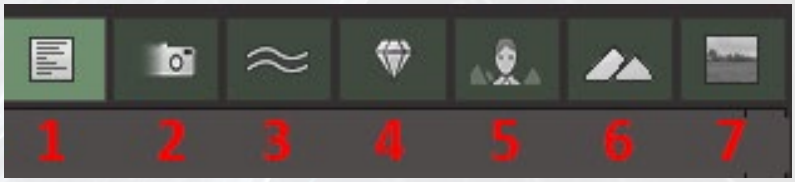
Sharpness categories, customised presets





Presets

Each **category** includes customised presets from which the automatic system selects and applies what it considers to be the optimum preset. If required, each of the presets offered can be selected manually. The presets are displayed by clicking on the **original** image or the small arrow next to it.

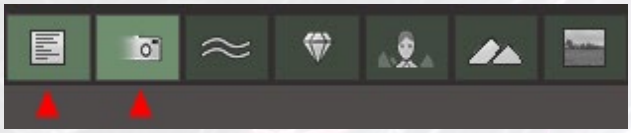


7 sharpness categories

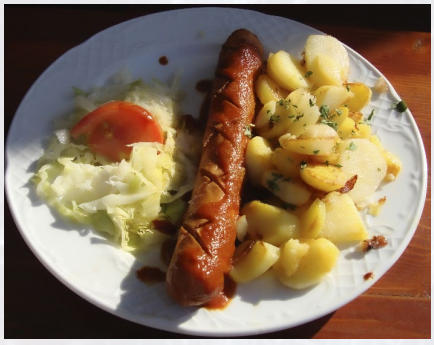
1. **All default settings**: Click on Original image to see the presets for **all** categories.
2. **Camera shake and blurring**: Here only the blur and blurring are reduced from **minimum** to **maximum** in the image without the **haze & fog correction**, the colours in the image remain unchanged.
3. **Haze & Fog**: This category is a speciality. **Nothing is sharpened here**, only haze and fog are reduced from **slightly** to **intensely** in the image.
4. **General image sharpness**: Here the image is sharpened evenly from **slightly** enhancement to **significantly** enhancement to **colour-optimised**.
5. **Portrait**: This category also offers special features. In addition to the sharpness gradations from **slight sharpness** to **intense sharpness**, you can select a **soft look** and a **black and white look** if required.
6. **Landscape**: Here, too, the image is not only sharpened in a differentiated way from **slight sharpness** to **high sharpness**, image looks such as **soft look**, **colourful**, **twilight hour** and **HDR look** invite you to experiment.
7. **Artwork**: The default settings are summarised here, usually combinations of **2 categories** such as **artwork – haze/blurring correction**, which are preferably selected by the automatic system and cannot be assigned directly in the other categories. You can also select special image looks here if required, such as high image depth, night shot or dramatic.

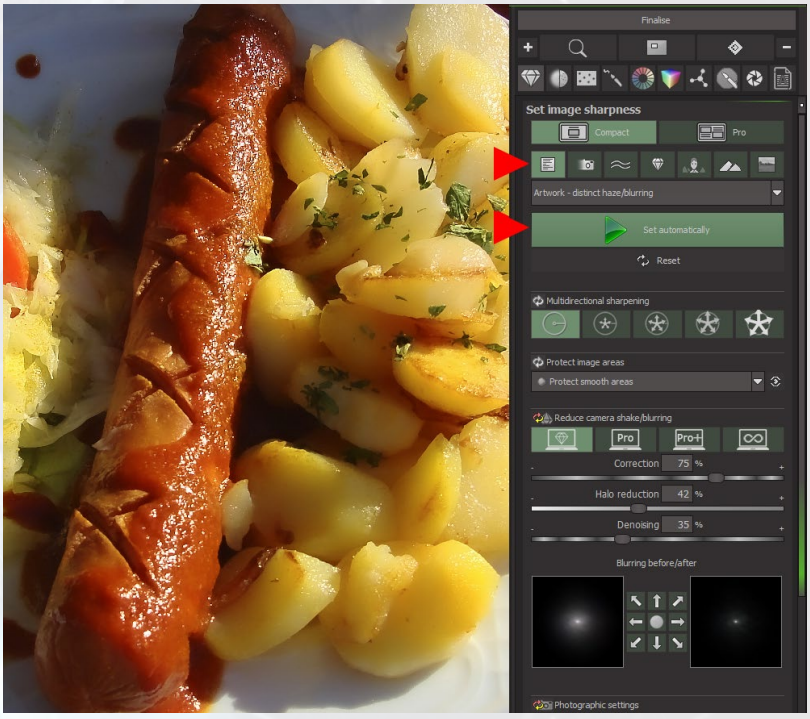
3 Sharpening methods

- **Camera shake**
- **General image sharpness**
- **Adaptive image sharpness**



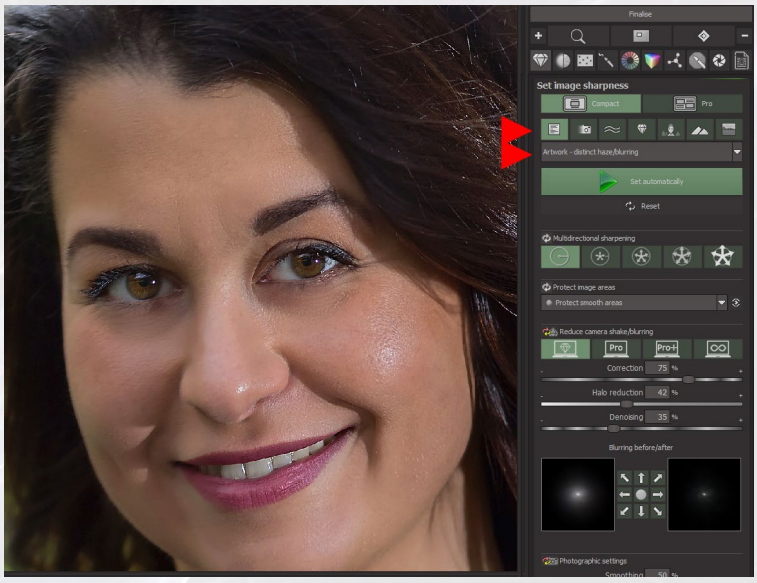
Sharpening method 1: Blurring correction
This sharpening method dominates the sharpening methods because it analyses the most common problems such as camera shake when taking snapshots with cameras without a tripod or mobile phone shots and corrects **minimal** or **intense** blurring in the image as effectively as possible.
Even **SHARPEN** can't do magic: no programme can conjure up ‘crisp’ results from completely blurred images, but you can experience everything that is possible here in astonishing quality.
Blurring correction can be found in the **first two** image sharpness categories. There is a special distinguishing feature between the two categories **All default settings** and **Camera shake & blurring**:





The first image sharpness category **All default settings** not only corrects **blurring** in the image via the automatic function, but also **haze and fog**. You have already seen the effects in the flash workflow: The subject is not only sharpened, it also becomes more colour-intensive, which is desired for many subjects like this one and is therefore usually selected by the **automatic system**, as in the example **Artwork - distinct haze/blurring**.

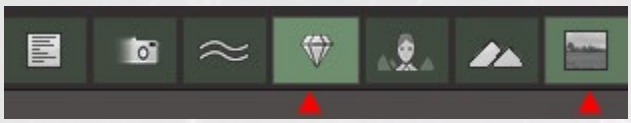
For portraits, where not only sharpening is used, but also the skin colour becomes more intense, ...



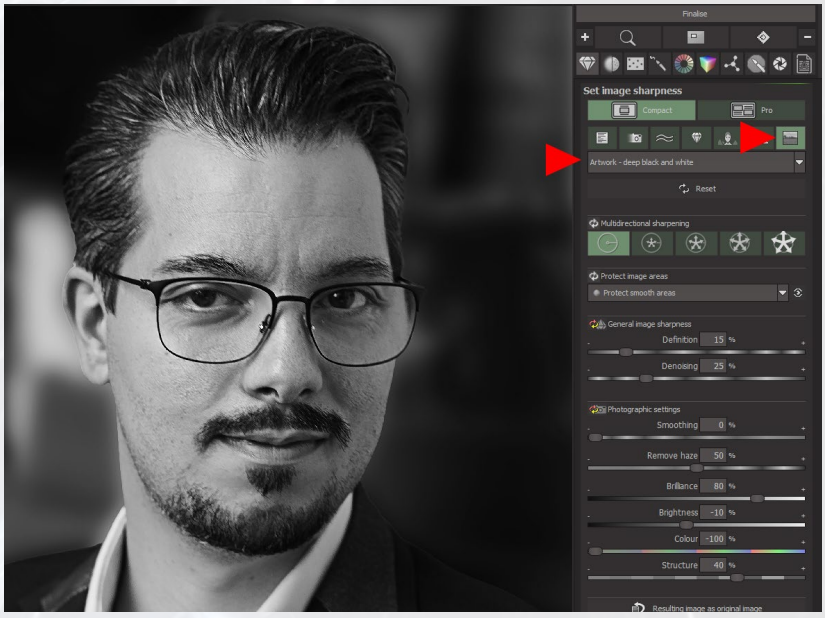
... as the comparison with the original shows, this is rarely intentional, as is the case here with **Artwork - distinct haze/blurring**, where the sharpening is a little too strong and the colours too intense. Depending on your taste, this can of course be intentional.

This is different with the same sharpening method in the 2nd category **Camera shake & blurring**, where only the blurring is removed and the colours remain untouched. As a result, the skin colours look as natural as in the original, the sharpening is not as differentiated as in the **Portrait** sharpness category, but it is very good and convincing.
Note: The fact that the sharpening does not appear too sharp here is due to the **Protect image areas**, which is set to **Protect smooth areas** by default in all image sharpness categories and is described in a later chapter.

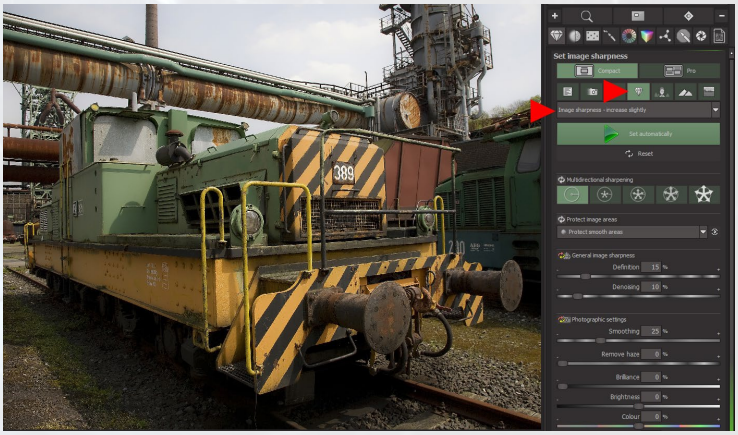
Sharpening method 2: General image sharpness



General image sharpness is used in the fourth and seventh image sharpening categories, i.e. in **General image sharpness settings** and **Artwork – default settings**. The special thing about this 7th category is that the sharpening method does not exist in 'pure culture' and the **automatic function is also missing**.
The associated presets are always a combination of **general image sharpness** and a **photographic setting** such as **slight haze/blurring**, which you are familiar with from the flash workflow.



The desired combinations or special image looks such as **deep black and white** in the example must always be clicked on manually.



This sharpening process does **not correct blurring**, but makes the image **sharper overall**, making it appear more present and 'crisper', as in the example of **category 4** with **image sharpness**.

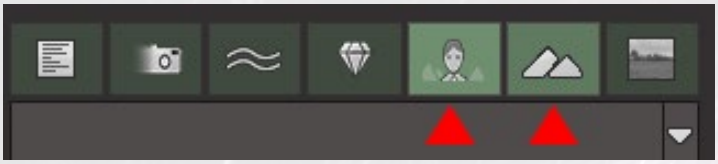
General image sharpness with further image look variations

Also Motifs like these ....

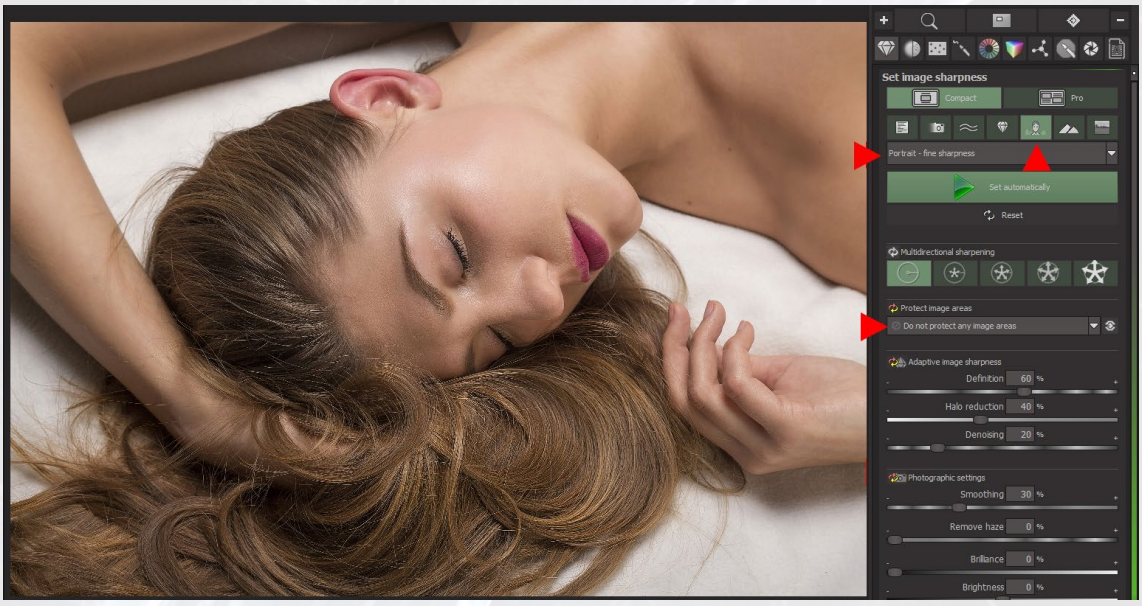
... are well suited for general image sharpness in category 4 with image sharpness increase ...

or in **category 7** with the combination of an offered image look such as **Artwork - colourful** in the example.

Sharpening method 3: Adaptive image sharpness



Adaptive focus is used in the fifth and sixth focus categories, i.e. **portrait** and **landscape**.



This adaptive image sharpening mainly sharpens only where there are contours. This means that it makes a clear distinction in sharpening between smooth surfaces such as skin in a portrait ...

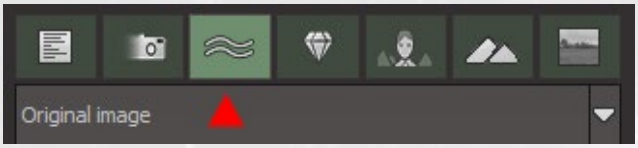
or smoother image areas in a landscape photo that are only sharpened very slightly, even though the **Protect smooth areas**, which is switched on by default, has been switched off. Image areas with contours, structures or details such as eyes, lips, nose, hair in portrait photos or detailed image areas in landscape photos are sharpened more.

The **method** of sharpening is the same in these categories, but they differ in the corresponding **default settings** for **portraits** and **landscapes**, which are adapted to these different types of motifs.

Here, the automatic **portrait - intense sharpness** has been selected for the **RAW Brilliant** preset. The skin is subtly sharpened, the eyes, lips and hair are sharper depending on the structure and richness of detail, which is just as intentional and fits the subject perfectly.

In this image subject, the automatic system has selected **high sharpness** in the **landscape category** with the same RAW brilliance preset, and the adaptive sharpening method also works as desired here and ‘provides’ an optimum result with ideally sharpened details and more discreetly sharpened, smoother parts of the image. It is therefore worth choosing the ‘right’ category.

Category Haze & Fog



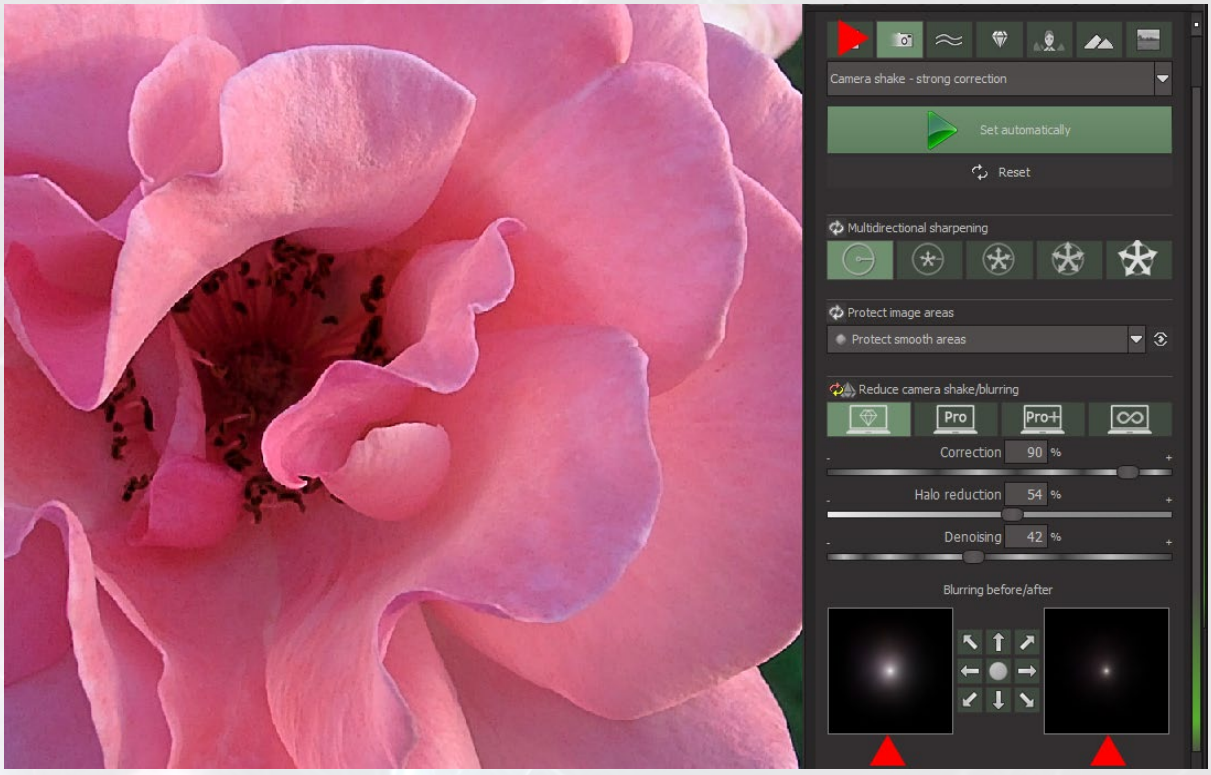
This category is a speciality: It does not sharpen, **but reduces haze and fog**.

The images still appear sharper than the original because this presetting influences the brightness values and the ‘deshading’ makes the colours appear stronger. Click on the small arrow or the ‘Original image’ button to display all four options in these categories, from **reduce slightly** to **reduce intensely**.

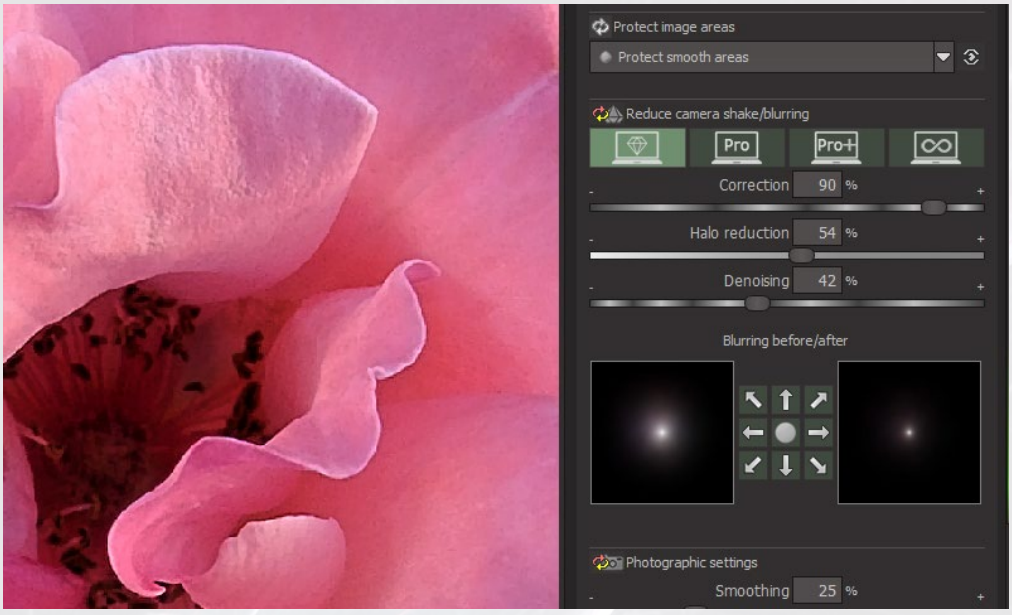
If you now trigger the automatic suggestion by clicking on **Set automatically**, the automatic system selects what it considers to be the optimum haze/fog reduction - in this case, greatly reduce.
Note: The following also applies in this category: If you ‘override’ the automatically suggested preset by clicking on another preset, this preset is immediately recalculated. Click on **Set automatically** again to return to the original preset.

5. Comparison view of blurring before – after

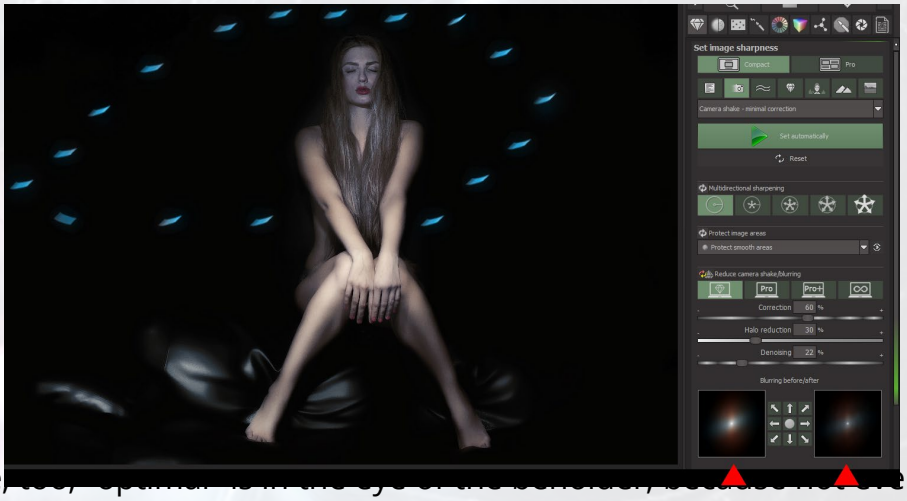
In the sharpening area, after loading an image file, your gaze automatically falls on the **comparison view**, which visualizes the distribution of the blurring of the original on the left and the visualization after the sharpening process on the right. If nothing has been sharpened yet, you will see the same view on the left and right.



This comparison view impressively visualizes a sharpening process: **On the left, the calculated blur around any pixel with the average blur distribution in the image** and **on the right, the result after the sharpening process.**
In the image example, the automatic system has selected the strong correction preset for **Camera shake & blurring**. The “blurred cloud” has become a small sharp point, which “confirms” the impression when looking at the resulting image.



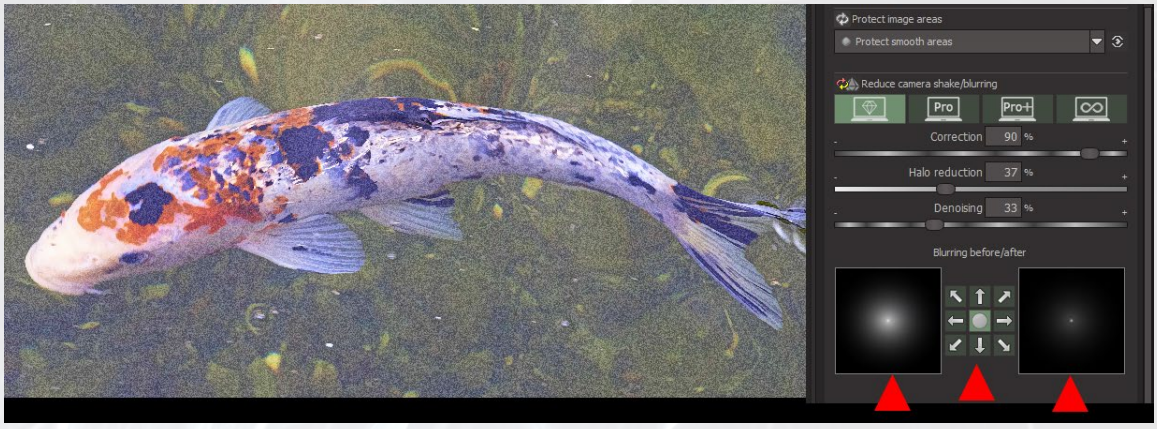
This **Point Spread Function** (PSF) illustrates the distribution of the blur of a single pixel of the original in terms of **extent, direction and color**. The expansion in the image example indicates a visible blur. And it has a (slightly reddish) color on the outside. **The larger the bright area, the more blurring was analyzed in the image.**
The **smaller this area is, the better** the sharpening worked. The automatic mode in the **Camera shake & blurring** category leads to a very convincing result in the comparison view: The “cloud” around the pixel with a large extension is reduced to a minimum, which suggests a cleanly sharpened result image, which is confirmed in the comparison.
Ideally, an almost single bright pixel should be visible in the center of the display.



But here, too, “optimal” is in the eye of the beholder, because not every optimal sharpening must be the best possible result for personal taste from the point of view of the program and in the image example only a slight sharpening with intentional remaining blurring is desired.

Manually influence the direction of blurring

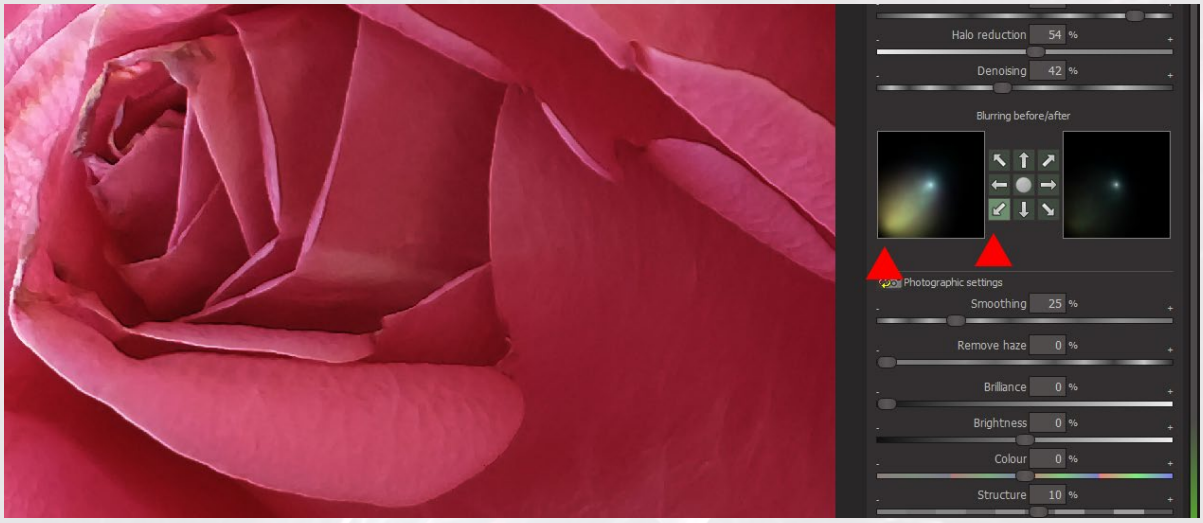
In the image example, the blurring of the original is distributed around the individual pixel and means an **undirected blurring**, which can happen, for example, due to inaccurate focusing or slight blurring.



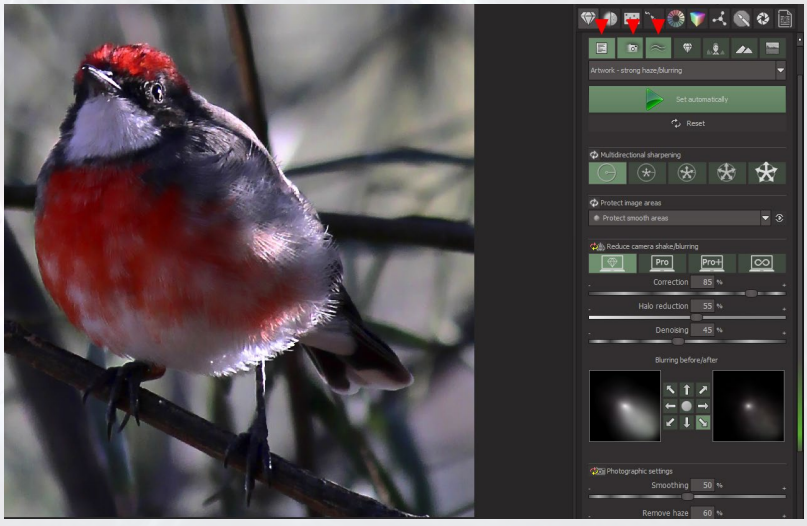
By clicking on one of the directional arrows or, in the example, on the circle, you can “tell” the program to focus with the **manual blurring correction,** in the example **Camera shake & blurring/maximum correction** and place particular emphasis on a **general blur reduction** that extends equally in all directions and has an intensifying effect. The resulting image confirms the promise and is very convincing.

In this image example, the directional blur goes from top right to bottom left.

Manually influence the direction of blurring

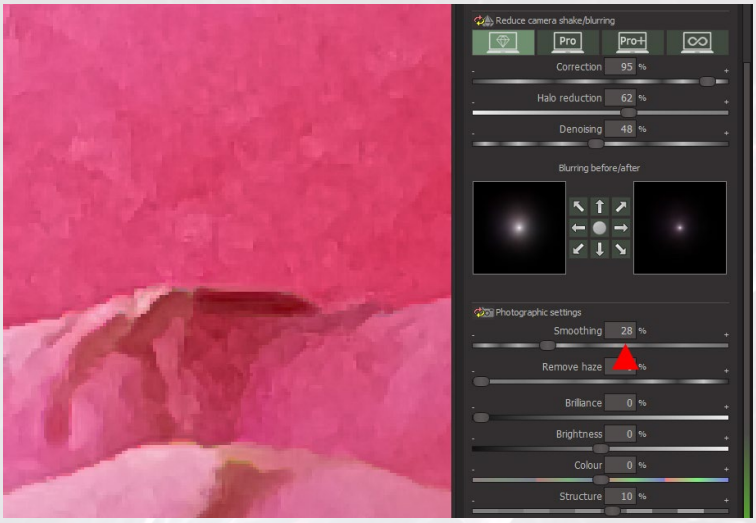


Clicking on the arrow pointing to the bottom left creates a **new point spread function** (PSF), which corrects the blurring with the selected sharpening method, as in the example **Camera shake strong correction** in **this direction**, whereby the arrows cannot be combined.
The result is a visibly more effective sharpening and leads to a minimal shift of the image in the direction of the arrow.
The colorations visualize that the sharpening is performed for each color channel.
Note: The **direction of the arrow should generally be selected in the direction of the blur shown**. in the example, to the bottom left or top right. An activated arrow pointing to the bottom right or top left would force the sharpness correction in the “wrong” direction and lead to a poorer result.
Click on the circle or one of the arrows again to deactivate these additional functions.
When **resetting** the currently selected sharpening method, this manually influenced directional blur is **not automatically deleted**.

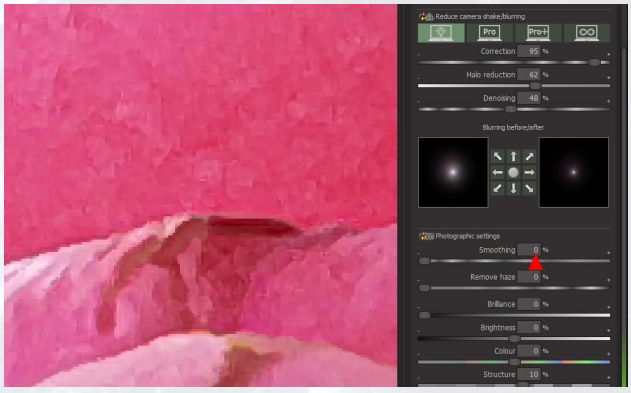


Note: This visualization of the blur distribution is only available in the **first 3** categories.

Smoothing slider



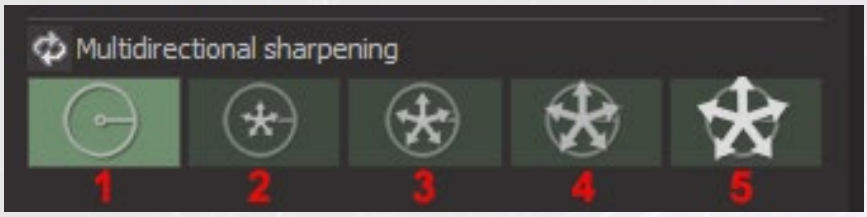
This slider causes **an integrated denoising of the original in the sharpening** and thus ensures better smoothing of the image. The automatically set level of smoothing, in the example 28%, depends on the automatically or manually selected presets, in the example **Camera shake - intense correction**.



If you drag the slider to the left to **0%**, the smoothing does not work at all, the image appears much more unsteady, ...

... with stronger smoothing up to a maximum of **100%**, the image appears more harmonious and calmer, especially at the edge transitions.
It is important to note that this smoothing does **not affect the sharpness**, unlike the **denoising control**, which also affects the sharpness.

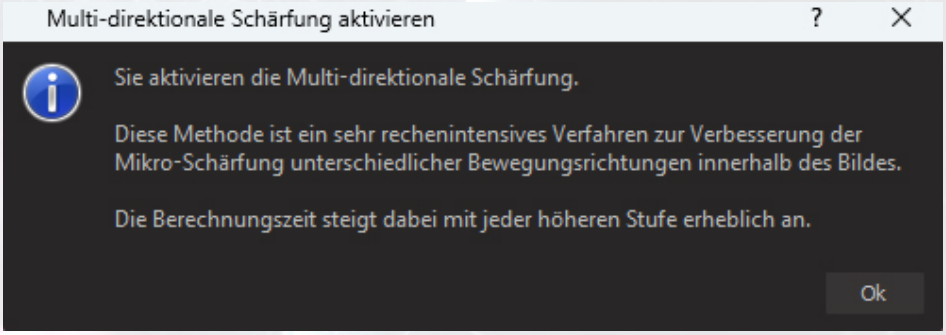
6. Multidirectional sharpening



This module is only displayed if you have triggered a sharpening process automatically or manually.
This **Multidirectional sharpening module**, which has been trained with neural networks, sharpens in different directions, as the name suggests. Most photographed images have blurs that are distributed around the individual pixels. This applies equally to **general blurring** caused by inaccurate focussing and to **directional blurring** caused by camera shake. Or objects such as cars on the road, people or animals have moved in the image.
Multidirectional sharpening does not **generally** determine this blurring or camera shake for the entire image, but for each individual pixel. It analyses the direction in which the blurring has occurred and corrects or reduces it significantly, bringing more sharpness to the image.
In addition, the **integrated halo reduction** (without its own controller) reduces unwanted brightness fringes, for example, which leads to even better quality results depending on the image motifs loaded.

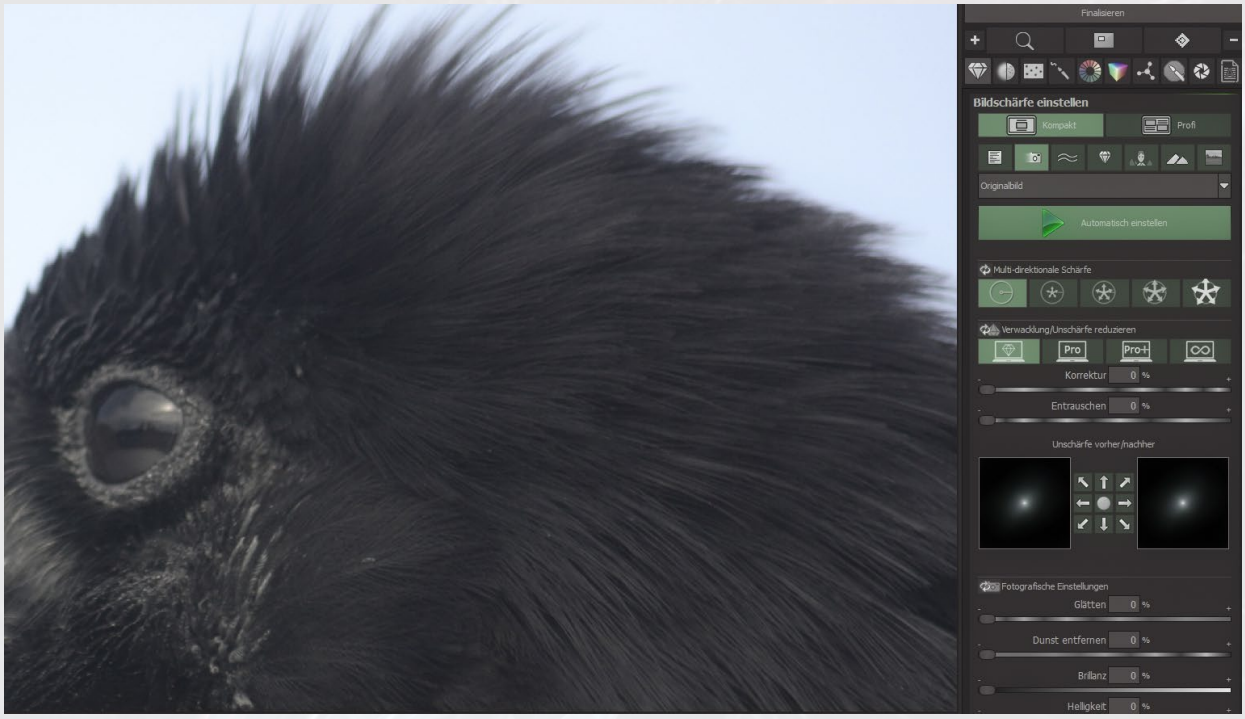
You can choose between five options or intensity levels, whereby the radius of the calculations increases from left to right, which is also illustrated by the increasingly larger stars.

Multi-directional sharpness is **switched off** by default, which is indicated by the green button (**1**).

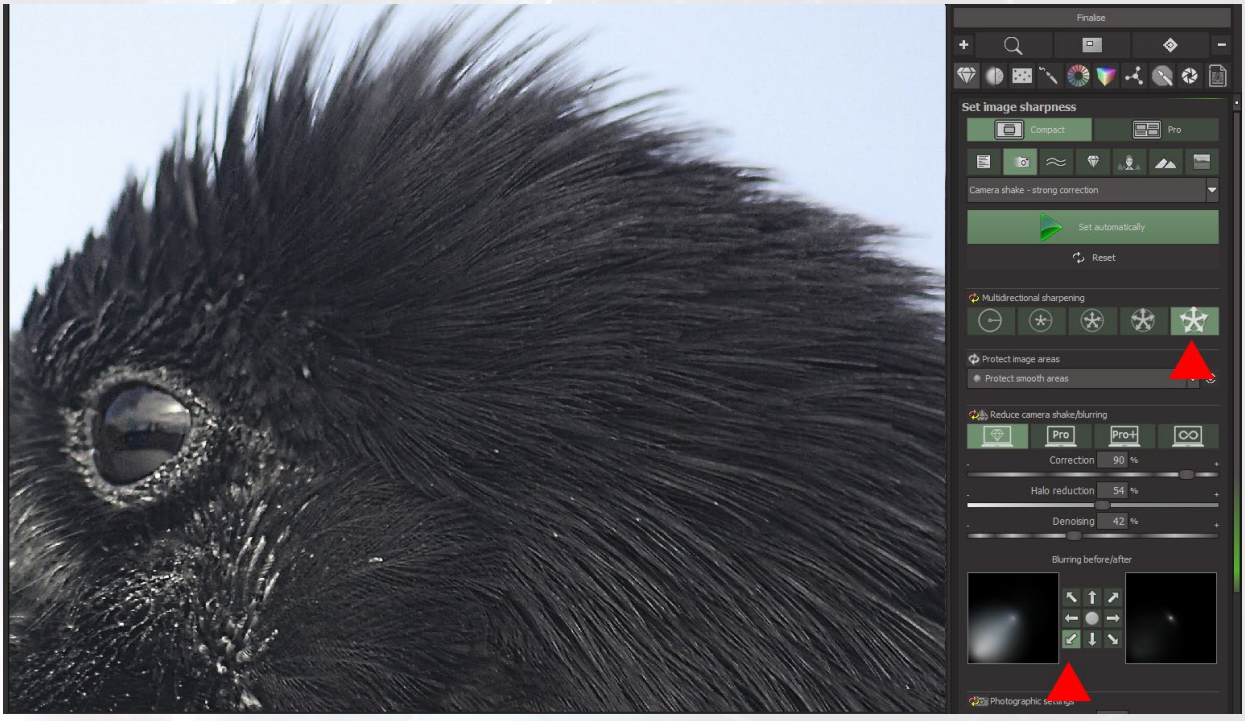


In the **first stage** (**2**), the multi-directional sharpness is activated with a small radius, in the **second** (**3**) with a medium radius, in the **third** (**4**) with a high radius and in the **fifth** (**5**) with a very high radius, which also increases the calculation time accordingly.
Note: The highest level is not always the best, as the result can also look exaggerated and unnaturally sharp.
Like all modules, this one can also be combined with others.
Reset: Click on the arrows to reset your corrections to the default values.

Example: Multidirectional sharpening **level 5**



The image example shows the loaded original image, in which everything appears somewhat blurred, especially the plumage and the eyes, ...

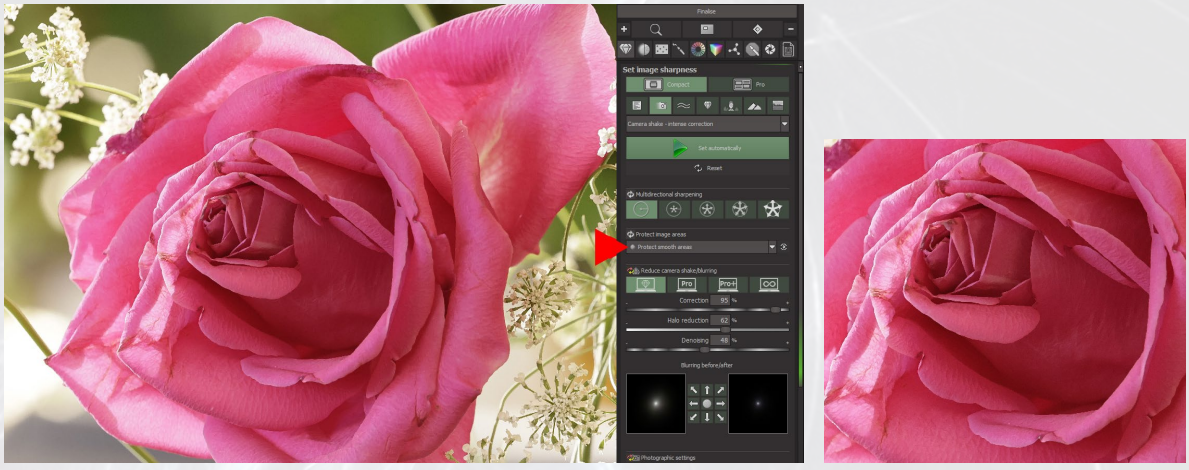


... has been sharpened with **Camera shake strong correction**. In addition, the **highest level 5** was selected **Multidirectional sharpening** , which leads to the impressive result: Practically every single feather of the feathers is recognisable and sharp, the same applies to the eye.
The additionally activated arrow in the **comparison view** has further increased the sharpening in the desired direction and optimised the result.

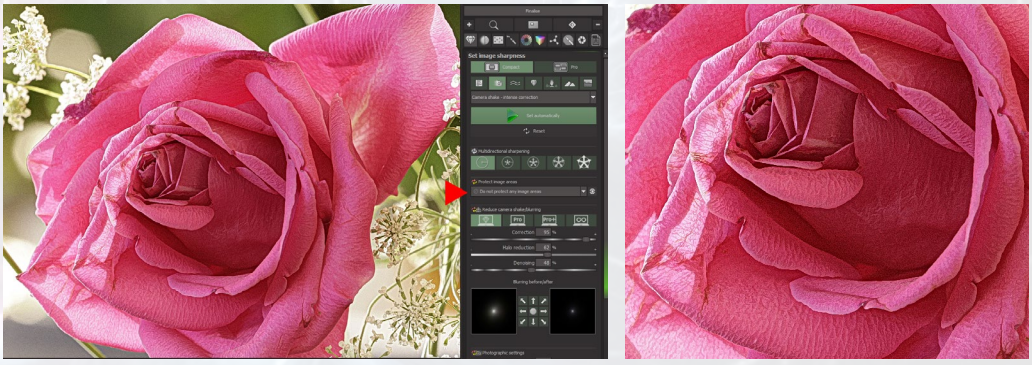
7. Protect image areas with 3D-variants

In other Accelerated Vision programs, you **decide individually** whether and which image areas you want to protect from certain influences such as micro details, graining or colour manipulation, depending on the motif loaded and the changes made.

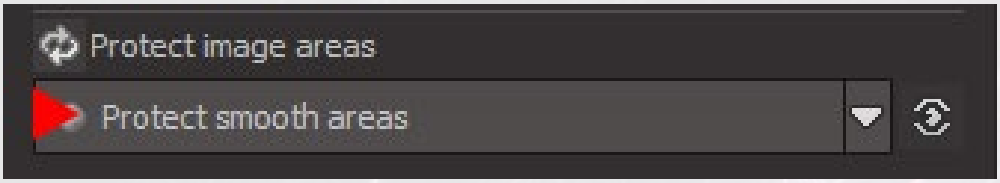
SHARPEN is different: load an image file here and leave the sharpening to the automatic system or sharpen manually, ...



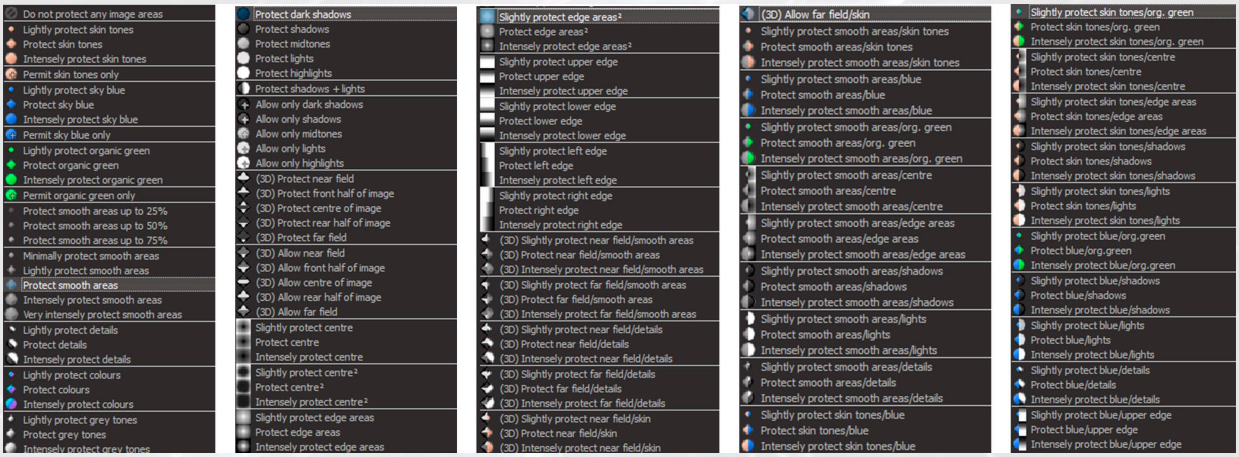
... the area protection **Protect smooth areas** is active by default. The result is a sharpened image which, despite intensive sharpening with **Camera shake - intensive correction**, makes the rose look pleasantly sharp, very present, but not unnaturally oversharpened ...



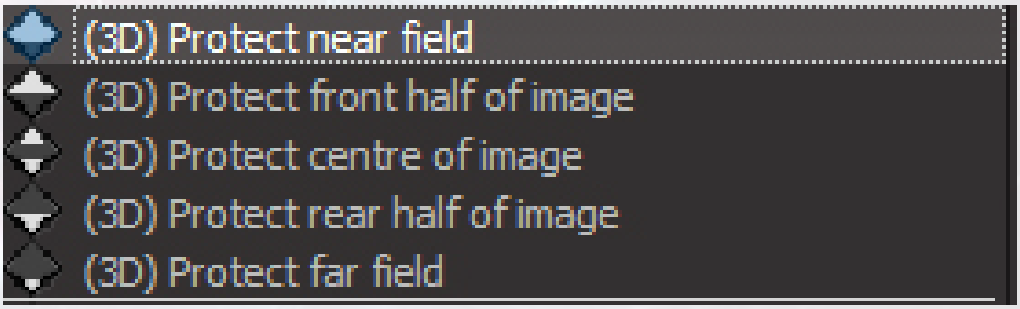
... as after **deactivating the protection** (**do not protect any image areas**).
Note: The **Adaptive** in **Portrait**, **Landscape** method differentiates very well even **without area protection**, and even **more specifically with area protection**.



The **Protect image areas** module with numerous options offers a further option on the way to an optimum sharpness result. It protects certain areas in the image slightly to intensively from the selected sharpening method and other additional settings that you may have made to optimise the image for your individual viewing habits.

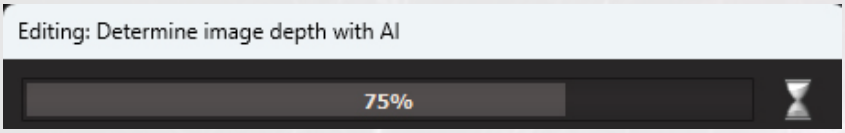


By clicking on the **Protect smooth areas** button, which is preset by default and covers most cases for differentiated sharpening, or the small arrow to the right of it, the various options for protecting certain image areas are listed in the drop-down menu.
Scroll slowly from top to bottom through the possible protection areas, you will see **individual area subdivisions** or colours such as **skin tones**, **sky blue**, **smooth areas**, **details**, **centre**, **edge areas**, which you can select specifically or combinations such as smooth/skin areas, skin tones/centre or blue/shadow protection.
Just as selected areas can be **protected,** areas are also offered where sharpening is specifically **permitted** and other image areas are excluded from sharpening.



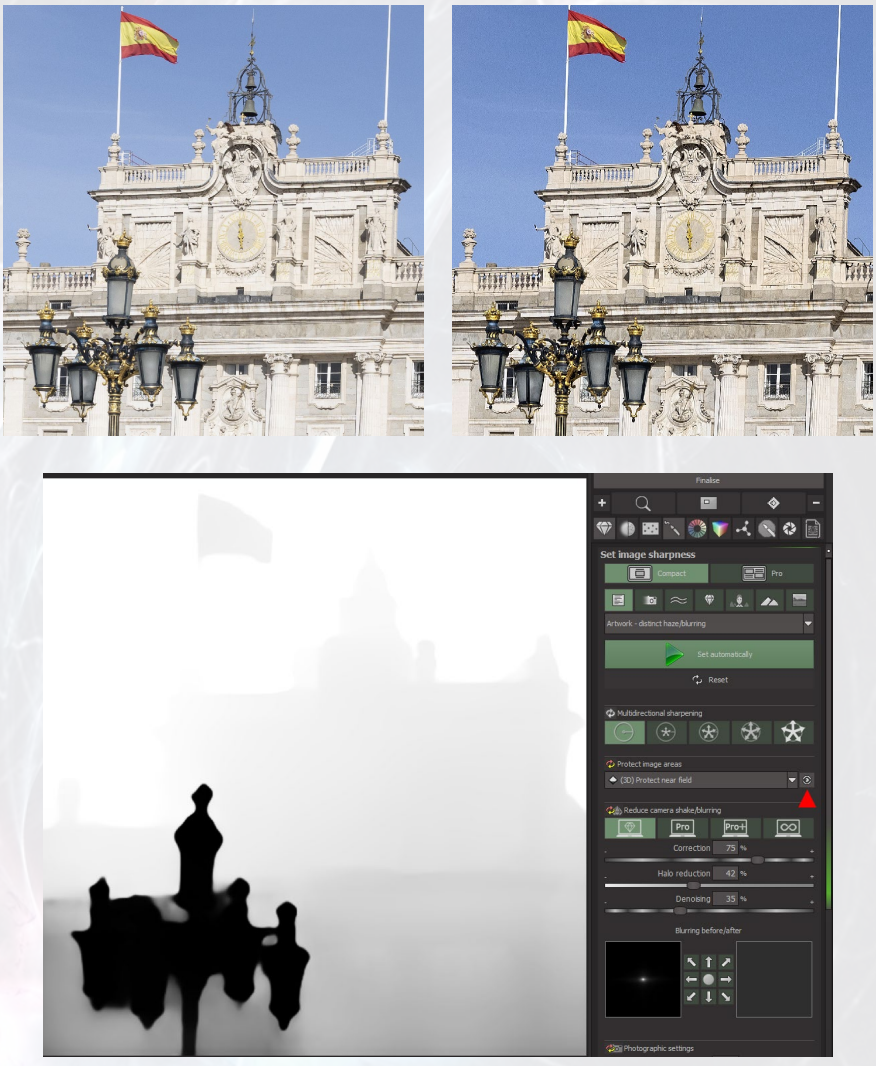
3D protection areas: Particularly interesting are the 3D areas from **near** to **centre** to **far** or the combination offers such as **close/smooth**, **close/detail** or **close/skin**, which can be recognised by the 3D in brackets. how is this possible?

Create automatic depth map



As described in the flash workflow, the information is displayed when a new image file is loaded: **Editing: Determine image depth with AI**. This is a basic function of the programme that generates a depth map for each image. If, for example, you crop an image, mirror the image, straighten or distort it in the RAW module, the depth map is adapted to the changed geometry of the image and prepared for the 3D area protection variants.

Visualisation of the depth map and the protected image areas:

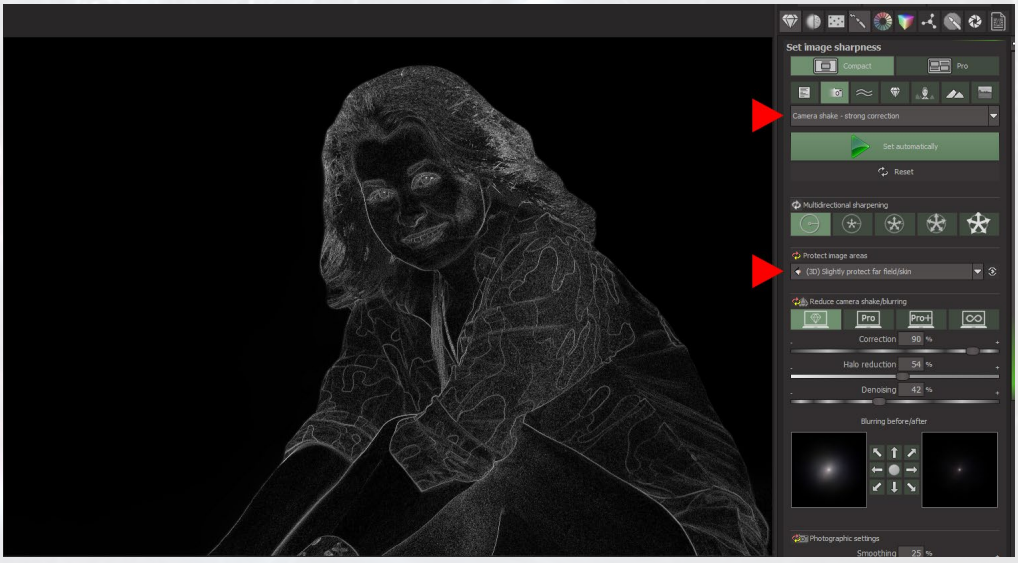


Protect close-up mask: For example, if you select **(3D) Protect near field** and click on the eye symbol to the right of it, the associated mask impressively visualises the desired sharpening and its exception: The close-up area with the lantern remains unsharpened (black to dark grey), the background receives the automatic sharpening of **Artwork – distinct haze/blurring**.
Note: The masks can of course be displayed for **all area protection offers**.

Mask combination (3D) distance/smooth intensive protection

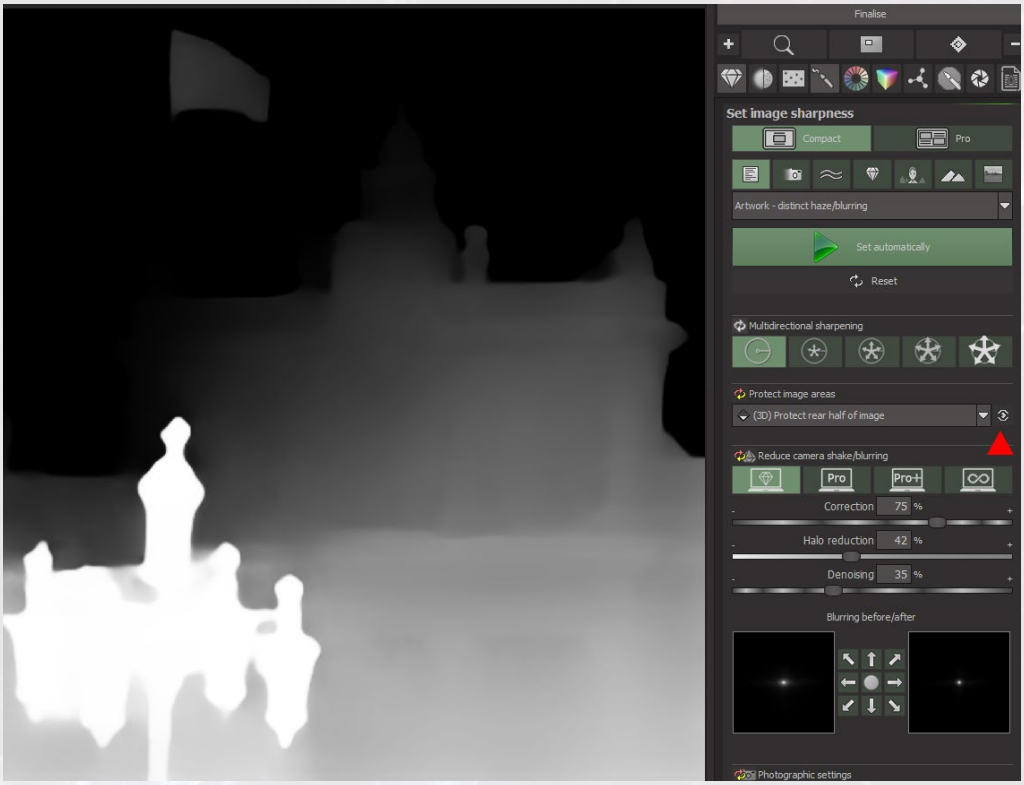
In the 2nd picture example the original ...

... with blurring - strong correction sharpened and the combination distance/smooth intensively protect has been chosen.

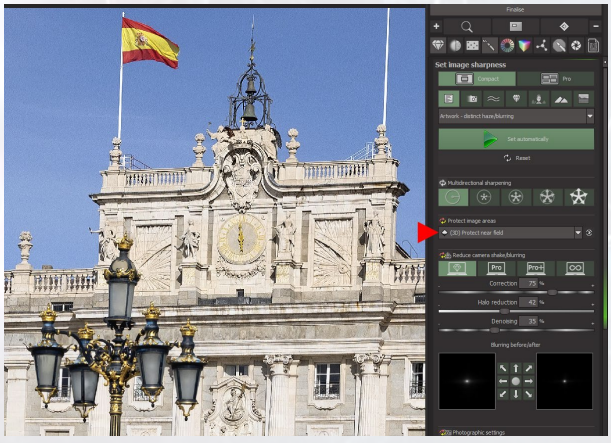


The displayed mask confirms the very convincing result: All smooth areas such as the skin and the background are excluded from the sharpening, all areas with contours or structures have been assigned the selected sharpness.

Mask (3D) Protect rear half of image



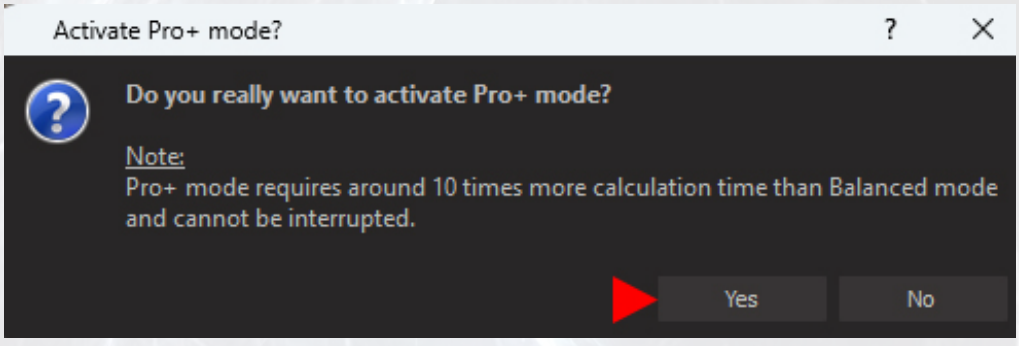
If, for example, the rear half of the image is to be protected and the impressive lantern in the foreground is to be more of a sharp eye-catcher, select **(3D) Protect rear half of image** or **Protect far field** and click on the icon to display this mask view, which shows that the white areas are completely sharpened and the light areas are slightly sharpened, the dark grey areas are slightly sharpened and the black areas are not sharpened at all. Click on the icon again to hide the mask.
With these area protection variants based on the depth map, you can determine yourself in which image area the sharpness and blurring should be located, and with the combinations you can control the sharpness distribution individually.



The resulting images confirmed what we had seen: the **background is sharp** (left) and the **foreground is sharp**.

8. Reduce camera shake/blurring, 4 Modes

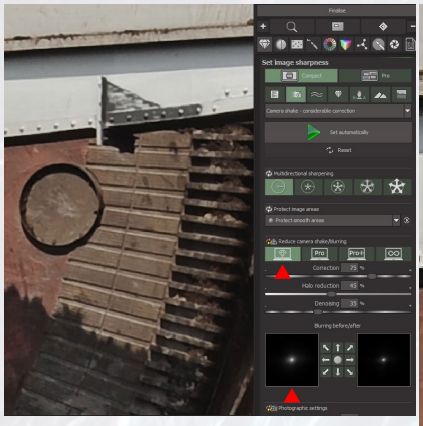
In this module, the four quality modes each increase the radius of the blur analysis.
You will only find it in the sharpness categories where the **camera shake/blurring** method is used (1 and 2), in the third category **haze & fog** and in the seventh Artwork with combinations **as Artwork – slight haze/blurring**.
In the **default balanced mode** (**1**), 50 pixels are calculated in each direction, which represents a compromise between quality and calculation time.
If the mode is increased by one level to **Pro mode** (**2**), the quality of the blur reduction also increases. In this mode, 100 pixels are calculated in each direction and the **radius of the blur analysis is increased accordingly**.
The (**Pro + mode** (**3)** increases the quality considerably once again and requires around 10 times the calculation time due to the 250 pixels calculated in each direction.

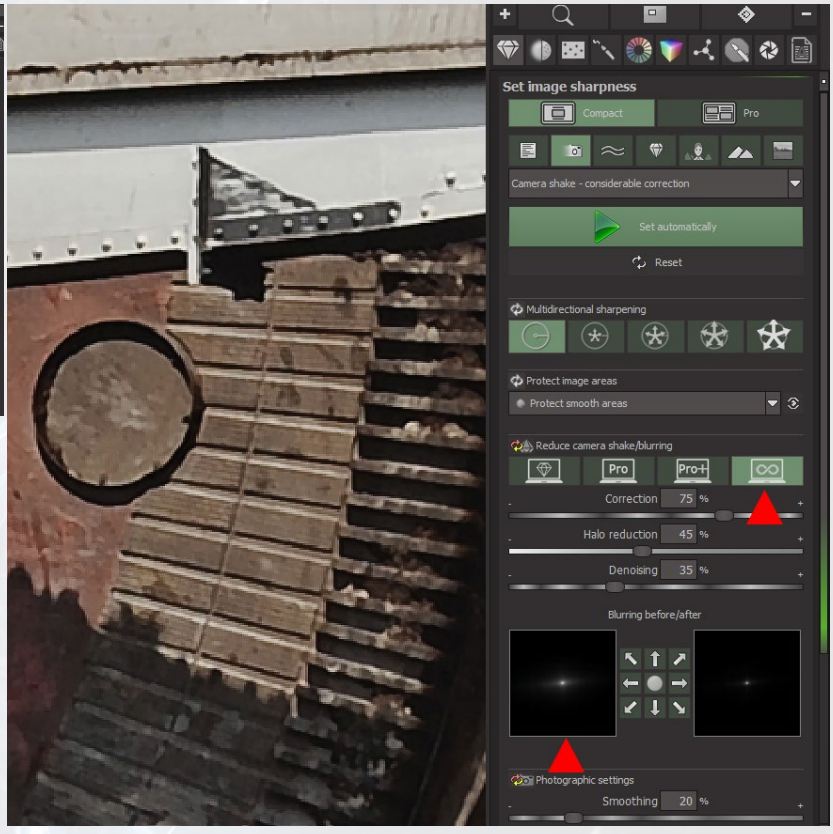


As in the following modes, the warning message that appears draws attention to the increased calculation effort that this entails.
Finally, **Pro Infinity** (**4**) increases the quality to the maximum possible. The warning about the up to 50-fold calculation time can also be displayed in **Pro +** with the 10-fold calculation time. In this last mode - **Infinity** stands for infinity - practically the entire image is included in the calculations. This also makes the structures and subtleties present in a loaded image visible. The result impresses in the image with a very pleasant sharpness, which is also visualised and confirmed in the comparison view.
It should also be noted here that each quality mode can of course be combined with other modes, for example with **Supersampling**.

Image example

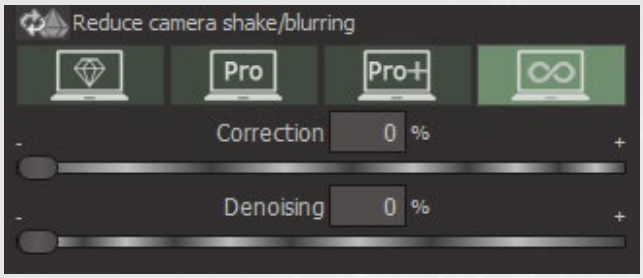
In this example, select any image section as shown in the graphic on right, ...

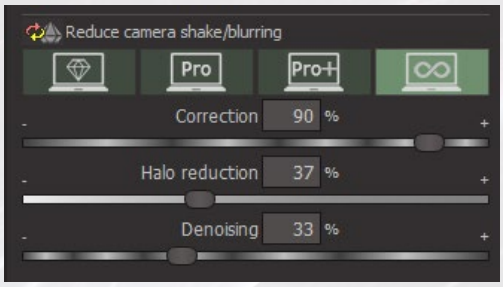




... the very good intermediate result after blurring, **camera shake – considerable correction in standard mode** looks like the image on the left. After switching on the **Infinity mode**, the resulting image is astonishing, even in the very high magnification, with a further improvement in quality and very homogeneous sharpness of detail.
The **comparative view of Blurring before/after** in both graphics confirms the extended calculation to the entire image.

Parameter

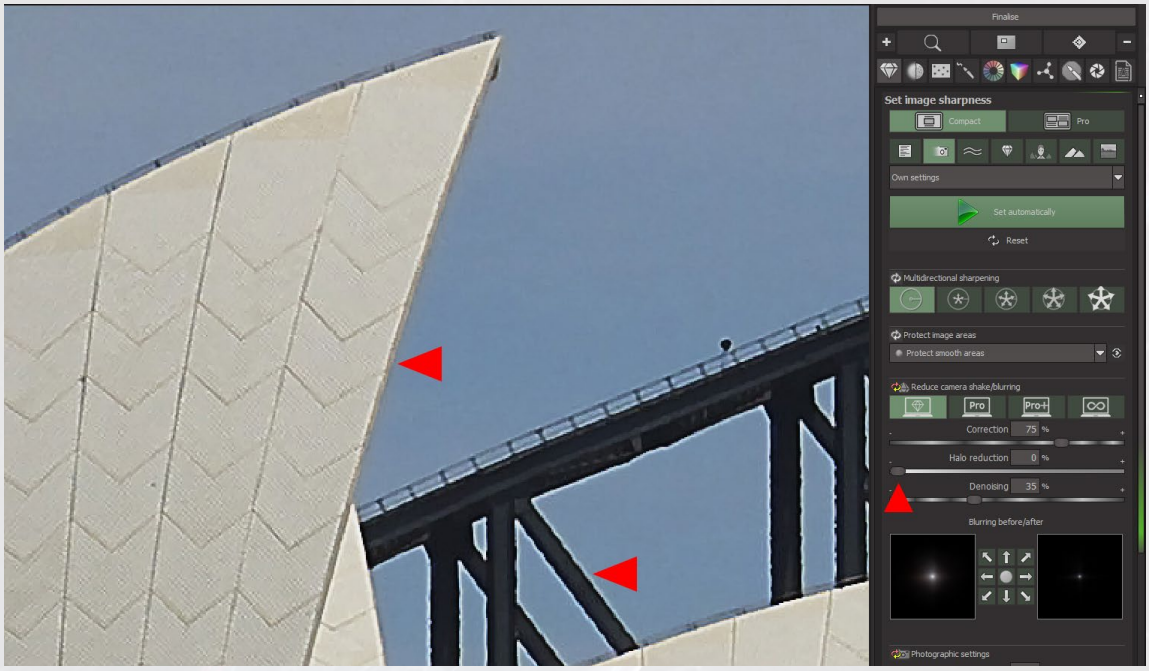




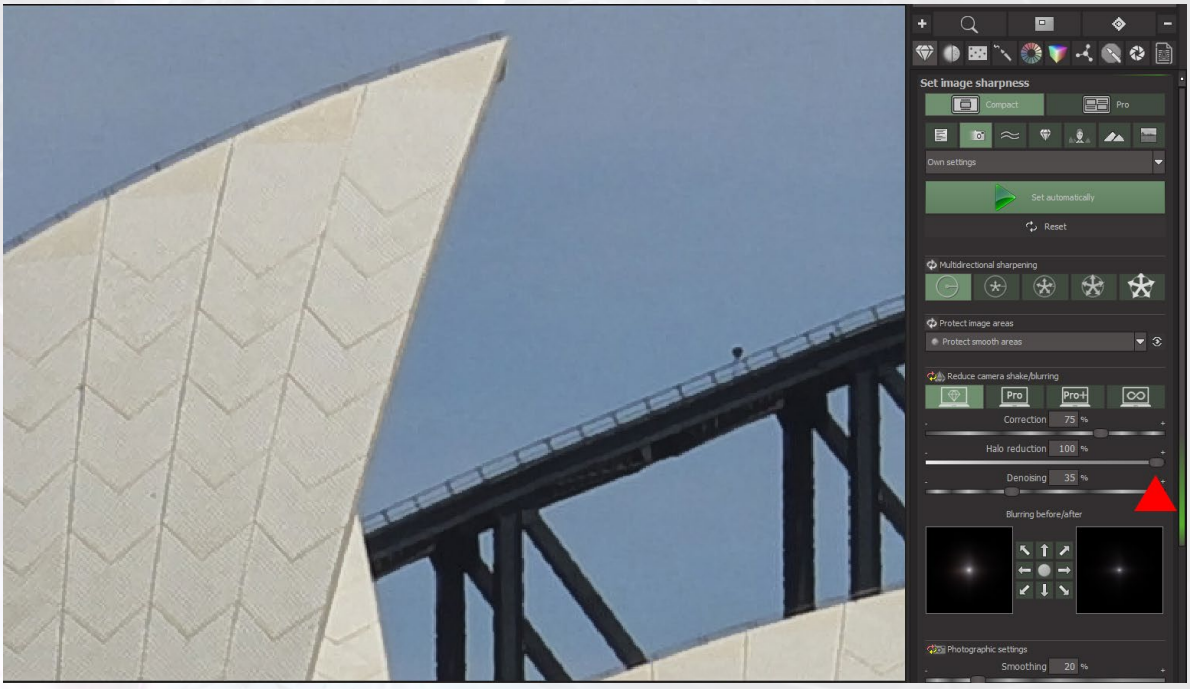
If you load an image file, the 2 parameters **Correction** and **Denoising** are displayed below the 4 modes (graphic on the left).
If a **camera shake/blurring** is triggered automatically or manually, an additional **Halo reduction** slider is displayed, which is omitted for **haze & fog**.
You can use these sliders to fine-tune the quality modes.
The preset values depend on the loaded image motif, the selected category and the default settings.
Correction: Use the **correction slider** to determine the **strength** or **intensity** of the blurring correction from 0% (no strength) to 100% (full strength).
Denoise: This slider causes the image to be denoised **before sharpening** as opposed to the **smoothing slider**.
Halo reduction: This slider 'takes care' of the unsightly halo contours ...

... especially at the transitions from edges, e.g. to the sky, as in this roof construction of the Sydney Opera House and especially the steel bridge in the background.

If necessary, **increase the preset by one level** to compensate for the slight loss of sharpness.



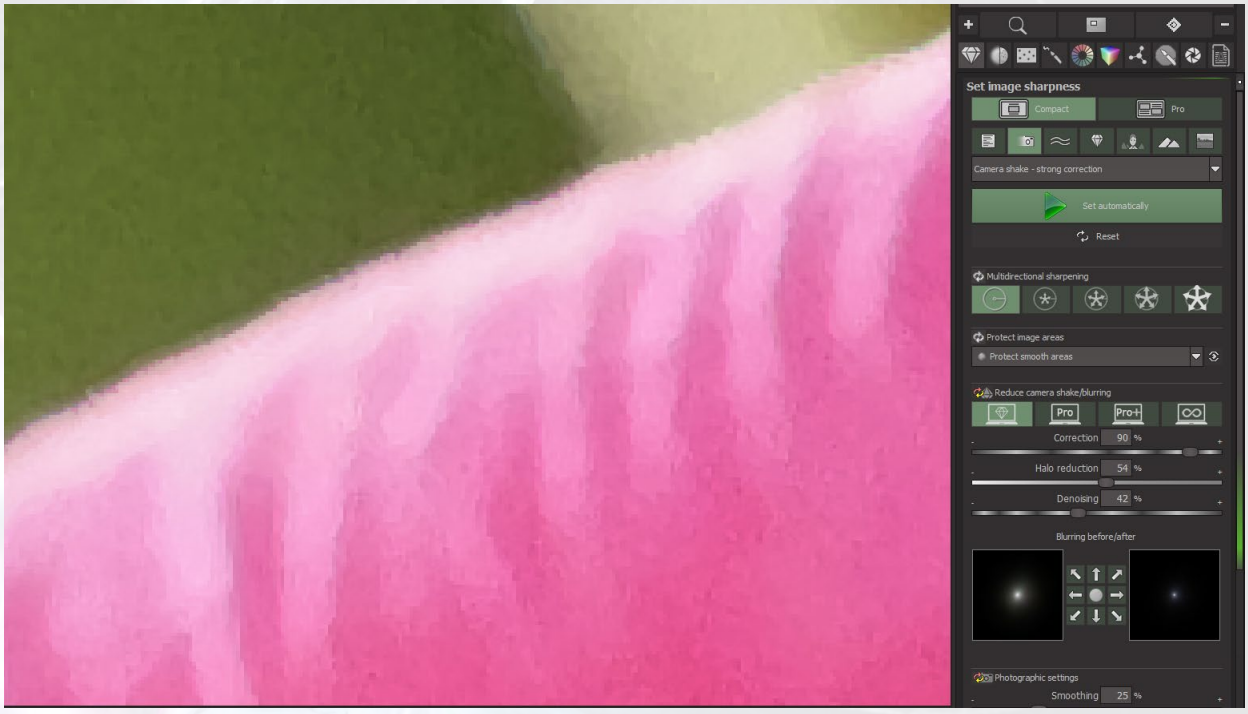
If the halo slider on the left is set to 0% for **Camera shake – considerable correction**, the result looks like this when enlarged, with unsightly transitions, especially on the steel bridge.
Note: As the value of 30% automatically set by the programme for this motif has been changed, the information **Camera shake – considerable correction** has become **Own settings**.



If you pull the halo slider to 100%, the difference is immediately apparent: the transitions of the roof construction have become ‘smoother’ and the white edges of the bridge have disappeared. This impressive correction is somewhat at the expense of sharpness, but this is hardly noticeable when zooming out and offers a good compromise with an average value of 30 to 50%.

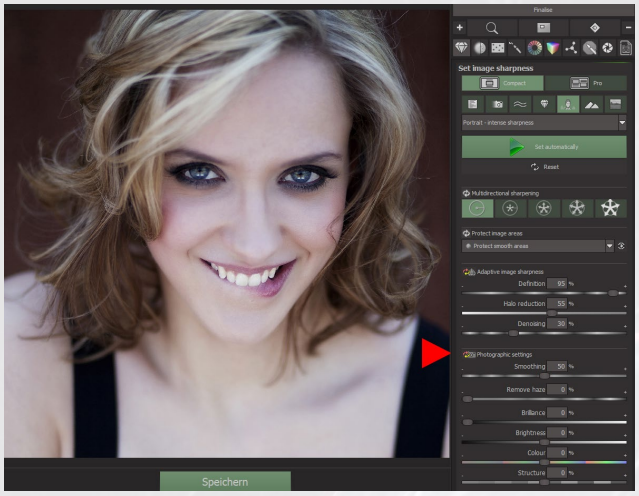
Relationship between subject - selected sharpness - slider settings

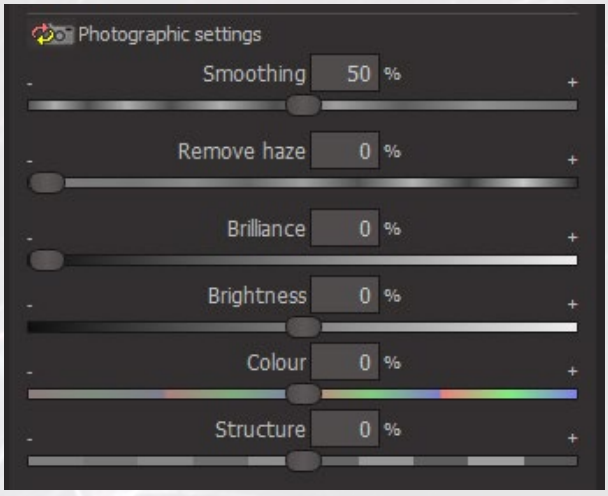
As mentioned, the slider settings are related to the loaded subject and the automatically or manually selected sharpness preset. The image section with the rose illustrates this once again: In the image on the right with the automatically selected **camera shake- strong correction** preset, the Halo slider has been manually set to 0% for demonstration purposes with the unsightly edge transitions.



The automatic system has selected the control settings **Correction 90%, Halo Reduction 54% and Denoising 42%** with a very good result.
The parameters are adjusted for **Camera shake – minimal correction**: Correction 60%, Halo Reduction 30%, Denoising 22%: **The stronger the sharpness preset, the stronger the corrections**.

9. Photographic settings





Photographic settings 'accompany' the sharpening processes in SHARPEN and can be used for **corrections** or, if required, independently of sharpening an image file to create a **different desired image look** or a different image statement.

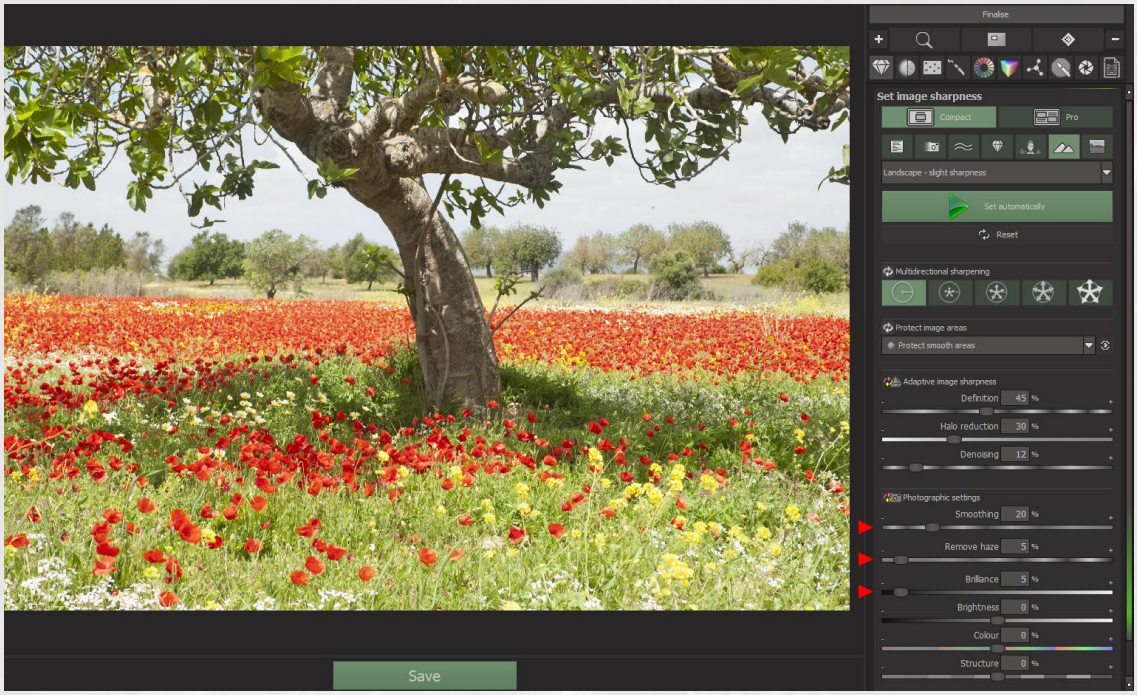
As a rule, you **do not need** to intervene manually here. If you start the automatic or manual sharpening process, in the **Portrait - intense sharpening** example, the slider settings adapted to the image subject and the sharpening method are displayed. When switching to another category, such as **Haze & Fog**, the slider settings change **accordingly.**

If you want to deliberately vary the image look after automatic sharpening or the image mood of the original, you can choose between various options in addition to the **Smoothing slider** described in the chapter **Comparison view of blurring before - after**:

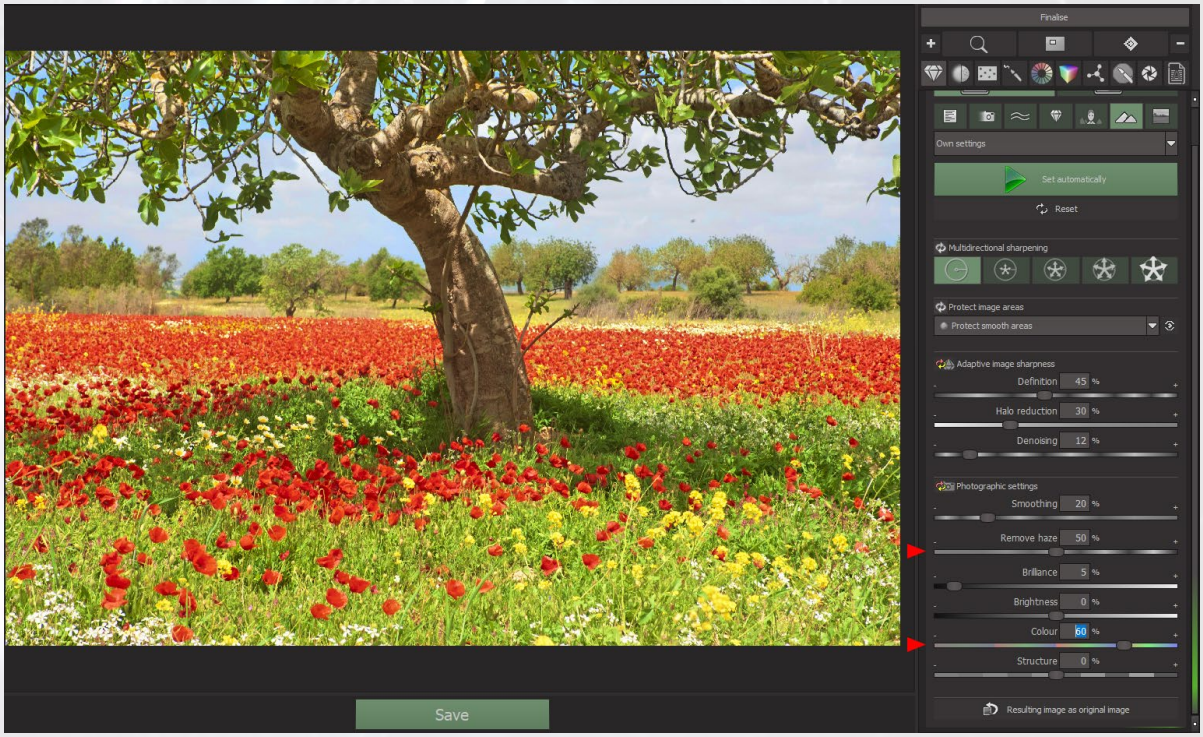
- **Remove haze**: Effectively reduces haze and fog in images. The more the slider is moved to the right, the stronger the reduction and the image is 'dehazed'. If the reduction is too strong, the result can be worse instead of better because, for example, the blue of the sky can become blotchy.
- **Brilliance**: Deepen the **depth effect** of the image subject the further the slider is moved to the right.
- **Brightness**: If you move the slider from the centre position to the left, the image becomes darker and to the right it becomes brighter.
- **Colour**: Here you do not change the colours, but the **colour luminosity**. To the left, the colours are **desaturated** up to the greyscale image, to the right, they become **stronger**.
- **Structure**: Changes the structure drawing in the image. If you drag the slider to the **left**, the image is **smoothed**, to the **right** all structures in the image are **intensified**.

Reset: Click on the arrows to reset all automatic or customised corrections.

Image example

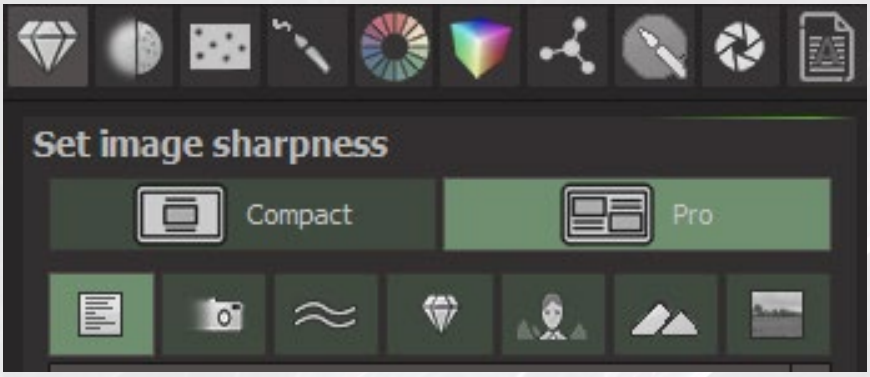


If you select the **Landscape** category in the image example and trigger the automatic function, the **Smoothing slider** is set to **20**, **Remove haze** to **5** and **Brilliance** also to **5%** under **Landscape - slight sharpness**, with all others set to 0%.
If, for example, you want to enhance the colours of the flowers and the meadow and 'blur' the somewhat pale sky, ...

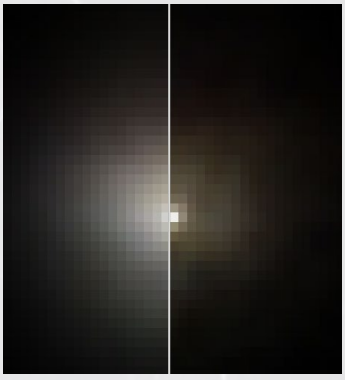


... drag the **Colour slider** to the right as desired (here **60%**) and the **Remove haze slider** also to the right to the value you want (here **50%**) and with just 2 slider changes you will quickly have a significantly different image.

10. Pro mode with additional modules



SHARPEN offers **2 interface modes**: **Compact** and **Pro** (Professional.
By default, after loading an image file, **compact mode is active** with the associated modules for **fast** and **efficient** processing.
All the modules you need for the flash workflow or a more advanced workflow are available at a glance without having to scroll up or down.
To see **all the options** on offer, switch the interface mode to **Pro.** The description above has already made it clear that you don't need to be a professional to do this; in this mode, you will see an even wider range of options that are collapsed in compact mode.

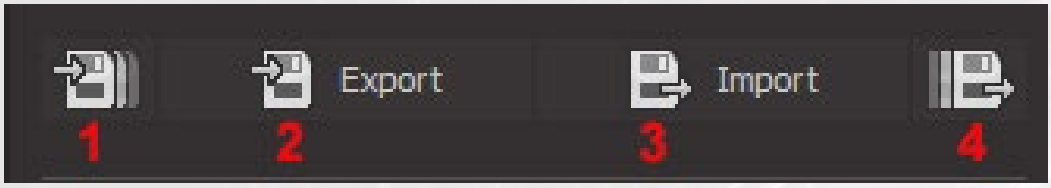


The additional offers are described in more detail in the following chapters:

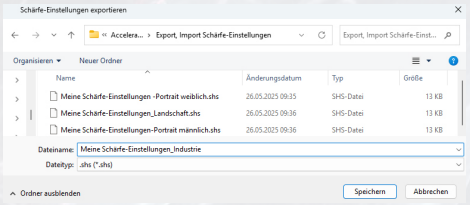
- **Export/import function** (graphic on the left).
- **Sharpness - colour dominance** (graphic on the left).
- **Oversampling** (graphic on the left).
- Button for **activating/deactivating artificial intelligence** (graphic left).
- **3 additional sliders for blurring correction** (centre graphic).
- Additional **direct comparison view** (graphic on the right) with precision slider for the **PSF function**, brightness/contours slider.

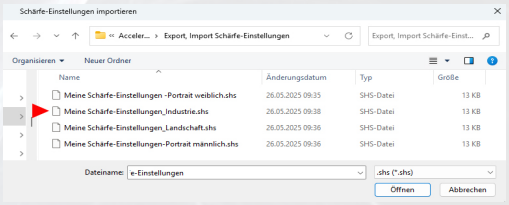
Note: The selected interface mode remains active even after closing and reopening the programme and must be changed manually.

11. Export/Import function

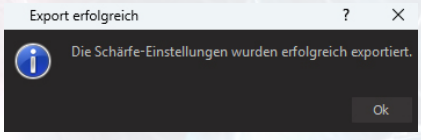


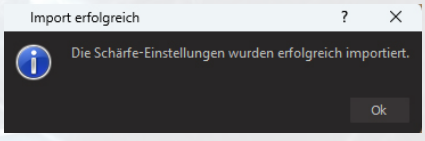
The **Export** and **Import** module can speed up your workflow and save or shorten the time spent repeatedly experimenting with different sharpening methods and individual settings.
Once you have automatically or individually sharpened an uploaded image file so that the result meets your requirements, you can export all the sharpening settings you have made **temporarily** or **permanently**. With temporary quick export, the settings can be immediately applied to other files. When saving to a file, the settings can be used identically at any later point in time.





Save settings permanently: Click on the **Export button** (**2**) to save the entire sharpness module with all current sharpness settings and photographic settings in all categories with the **exception of supersampling as a separate module** in a folder of your choice (graphic on the left).
Click on **Import** (**3**) to open the same folder (image on the right) and you can import the desired file and apply it to another image. This is very practical because you can transfer the exact same sharpening to other images with all the combinations you like.
Another advantage is that you can later combine these saved settings with all supersampling variants if required.
Save settings temporarily: In addition to saving them permanently in a file, you can temporarily use the sharpening you have found for other image files as long as the programme is not closed.





If you click on the button to the **left of Export** (**1**), the export of your settings is confirmed in the dialogue window that then opens (graphic on the left). If you then load another file and click on the button to the **right of Import**, the dialogue window that opens (graphic on the right) confirms the successful import of the sharpness settings.

12. Sharpness colour dominance

The **Sharpness colour dominance module** is displayed when you trigger the automatic function or move one of the sliders of a sharpness range. In this module, you have the option of **specialising the image sharpness process to a selectable colour space, to dominant colours**. These are (from left to right) **neutral grey, red, orange, yellow, green, turquoise, blue and violet**. A selected **main colour** ensures that the sharpening process treats the selected colour tone with increased precision and thus produces finer accuracy.
The two symbols **Camera** (**1**) and **Eye** (**2**) **automatically determine a colour dominance** when they are active: Translated with DeepL.com (free version)
If you activate the *camera* symbol by clicking on it, the **colour dominance is automatically determined from the camera data of the original image**.
With the **eye symbol** activated and **preset by default**, the colour dominance used corresponds to the **brightness perception of the human eye**. This so-called 'retina method' rates red at around 21%, green at 72% and blue at 7%, which corresponds to the colour distribution of the human eye and consequently means that **green is calculated more accurately than blue**. If you want to change this for orange tones, for example, which usually dominate in skin tones, the result only changes minimally, but these subtle differences can make the difference to a perfect result image.

As a rule, you do not need to intervene manually in this module and rely on the default settings.
Reset: Click on the arrows to **reset the individual settings** to the default value.

Image example

The colour **red** dominates in the picture example.

The automatic system has sharpened the image with **camera shake – considerable correction**. The setting in the **Sharpness - Colour dominance** module is set by default to the 'normal' brightness perception of the humaneye.

By clicking on **Red-dominant**, the **red colours are calculated more accurately** than the others during sharpening, the result is nuanced better in the enlargement than in the standard setting, but not a great leap in quality.

13. Oversampling

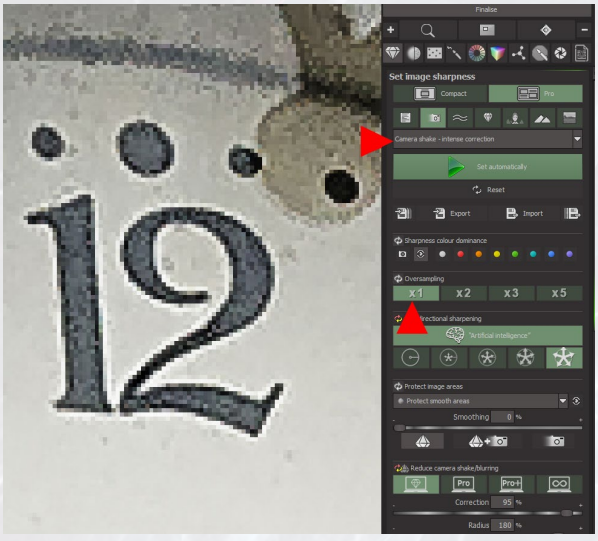
Oversampling is based on all the sharpness settings made up to that point for an uploaded image, such as **automatic**, **multi-directional sharpness** or individually selected **area protection**, and converts these calculations into a **multiple calculation** (cascade), whereby each calculation is performed at a lower level, which leads to more balanced, nuanced results with finer details and reduced sharpness halos. It therefore makes sense to experiment with the different oversampling levels at the end or **before the final supersampling**. The oversampling level specifies the number of calculation levels in which the resulting sharpness in the image is to be calculated. **The more levels** are selected, **the finer and therefore more precise** the result of the generated image sharpness will be.

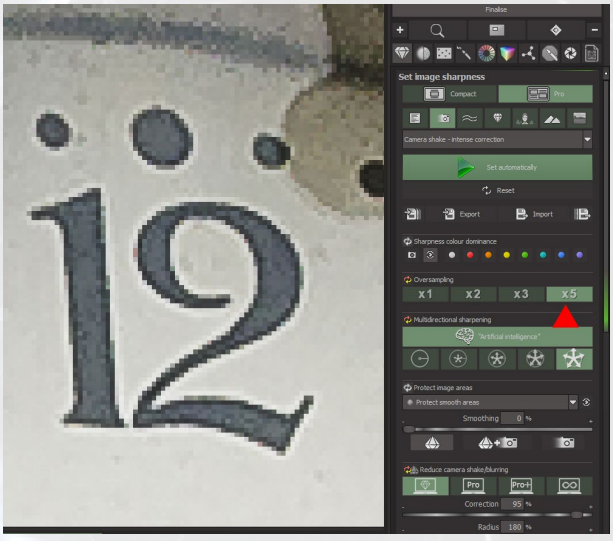
- **Single Oversampling**: The **default 1x oversampling level is the normal mode** and calculates the image sharpness in **one pass** from the original to the resulting image.
- **Double Oversampling**: With **2 –fold oversampling**, the image sharpness is calculated more precisely in two automatic successive steps: **In the first step, the original is sharpened by around 50 % and the resulting image is sharpened again by around 50 %.** This step-by-step procedure enables finer and more detailed results.
- **Triple Oversampling**: With **triple oversampling**, the sharpening is calculated in three successive steps.
- **5-fold-Oversampling**: With **5-fold oversampling** in five consecutive steps, the sharpening is still calculated somewhat more finely and precisely in 5 consecutive steps.
  The sharpening is not only finer and more nuanced, a further advantage is the avoidance of more sharpness halos in the image compared to sharpening an image 'in one go'.
  Consequently, the difference between single and fivefold oversampling is the clearest and most visible. At the same time, the computing time increases accordingly.

Reset: Click on the surrounding arrows to reset the oversampling to the default value.

Image example

If this image file is created with ...

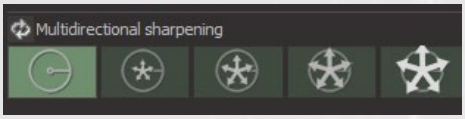




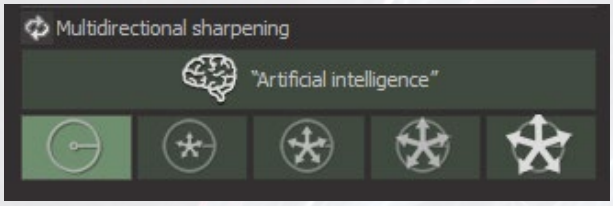
... **Camera shake - intensive correction** sharpened and customised with various parameters, the result looks very good in the high magnification (graphic on the left), but could appear a little 'calmer' and the slight halo effects a little more reduced.
After selecting **5-fold Oversampling**, the desired effect of the complex calculation process is visible in the strongly zoomed view ...

... and as expected also in the 'normal' view.

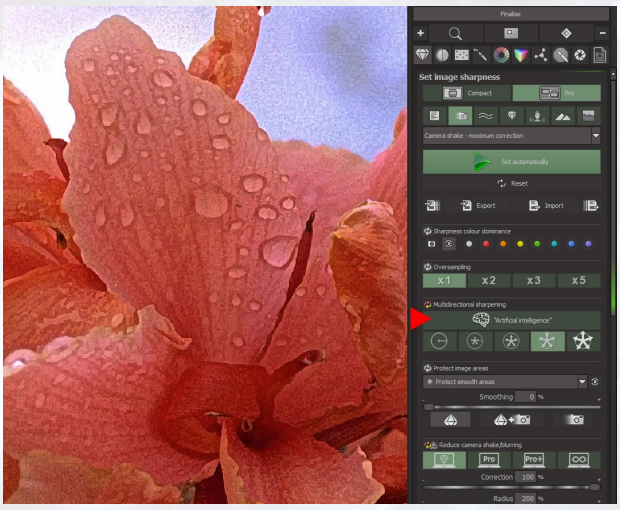
14. Multi-directional sharpness: deactivate/activate AI

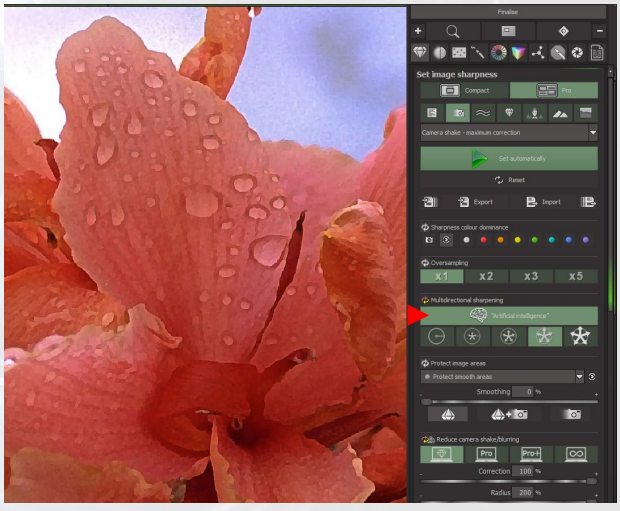


This module is described in compact mode in the **Multi-directional sharpness** chapter.
By default, the **Artificial intelligence button is active, highlighted in green** and indicates that the module has been trained with several neural networks specifically for the task of blur reduction in different directions.
In **professional** mode, you can decide whether the multi-directional sharpness algorithms should be calculated **with or without AI**.



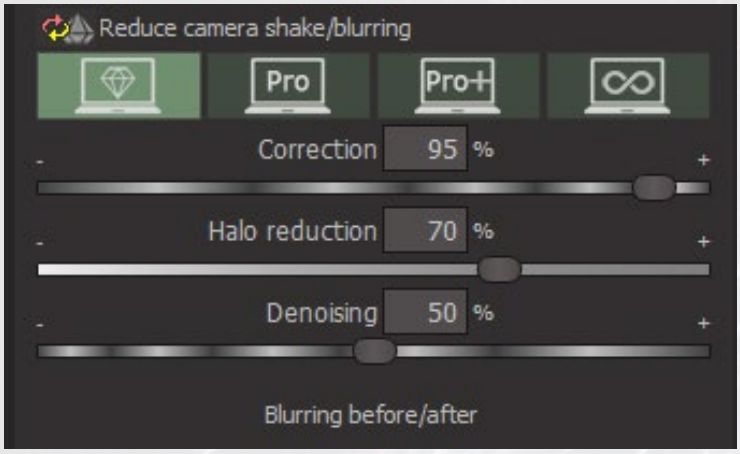
If the **artificial intelligence is switched off** by clicking on the button, the green becomes grey and the multi-directional sharpening is calculated using the **conventional local PSF** (Point Spread Function) blurring algorithms.



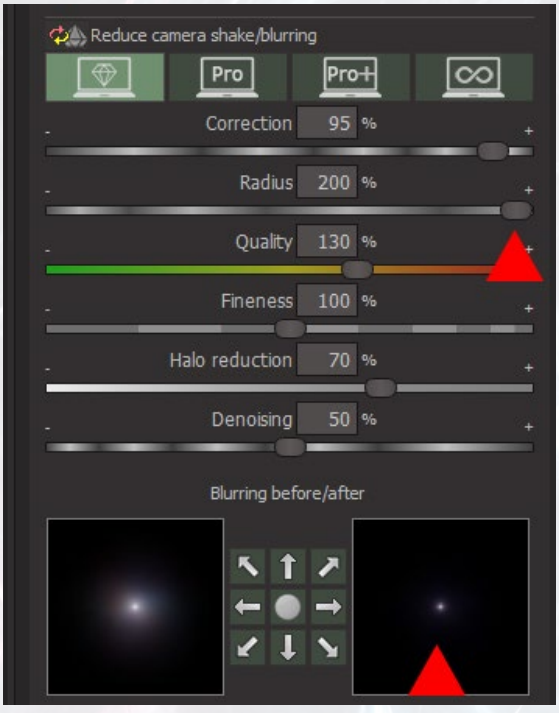


The comparison of **AI off** (diagram on the left) to **AI on** (diagram on the right) shows in the greatly enlarged view that the result appears more homogeneous and 'calmer' with AI.
It therefore only makes sense to deactivate it in exceptional cases.

15. Reduce camera shake/blurring with 3 new sliders



In addition to the familiar controls from the **compact mode** (diagram on the left), this module in **Pro mode** with the 4 quality modes has been supplemented by **3 further controls** (diagram on the right), which enable even finer tuning and more individualised adjustment if required:
Radius: Use this slider to select the desired radius of the camera shake:

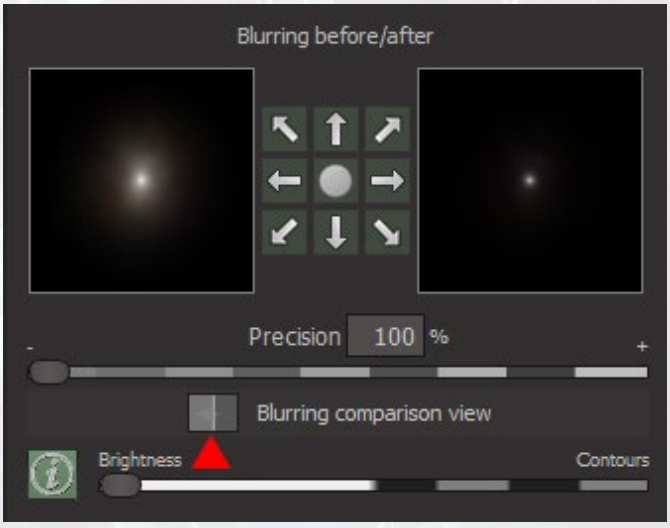


A **high value** corrects **large-scale blurring** (diagram on the left) and requires more calculation time, a **low value** corrects **small-scale to localised blurring**.

- **Quality:** Use this slider to influence the quality of the correction: the **higher** you drag the slider to the right, **the more detailed blurring is corrected**.
- **Fineness:** Here you can specify whether the correction should concentrate or focus more on **large** (slider on the left) or fine areas (slider on the right).

16. Great Blurring comparison view

The comparison view, which you are familiar with from compact mode and which visualises the analysed blur/blurring on the left and the correction result on the right, as in the image example for **camera shake - strong correction**, ...

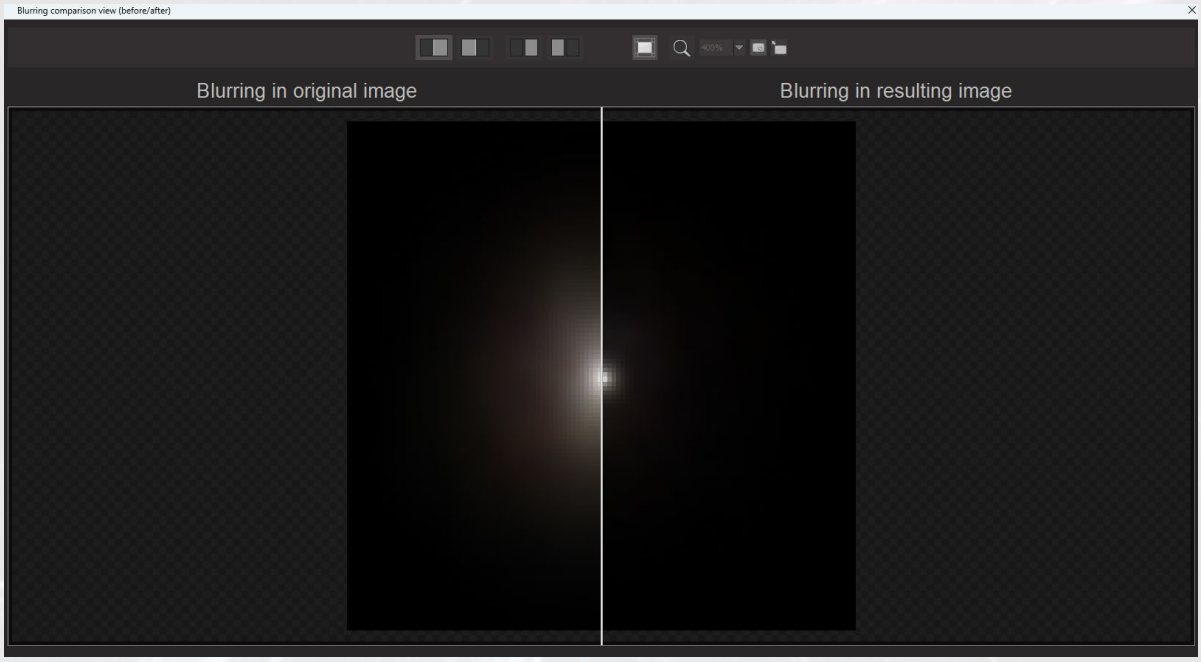


... has been expanded in professional mode to include the **'large' comparison view and 2 controllers**:

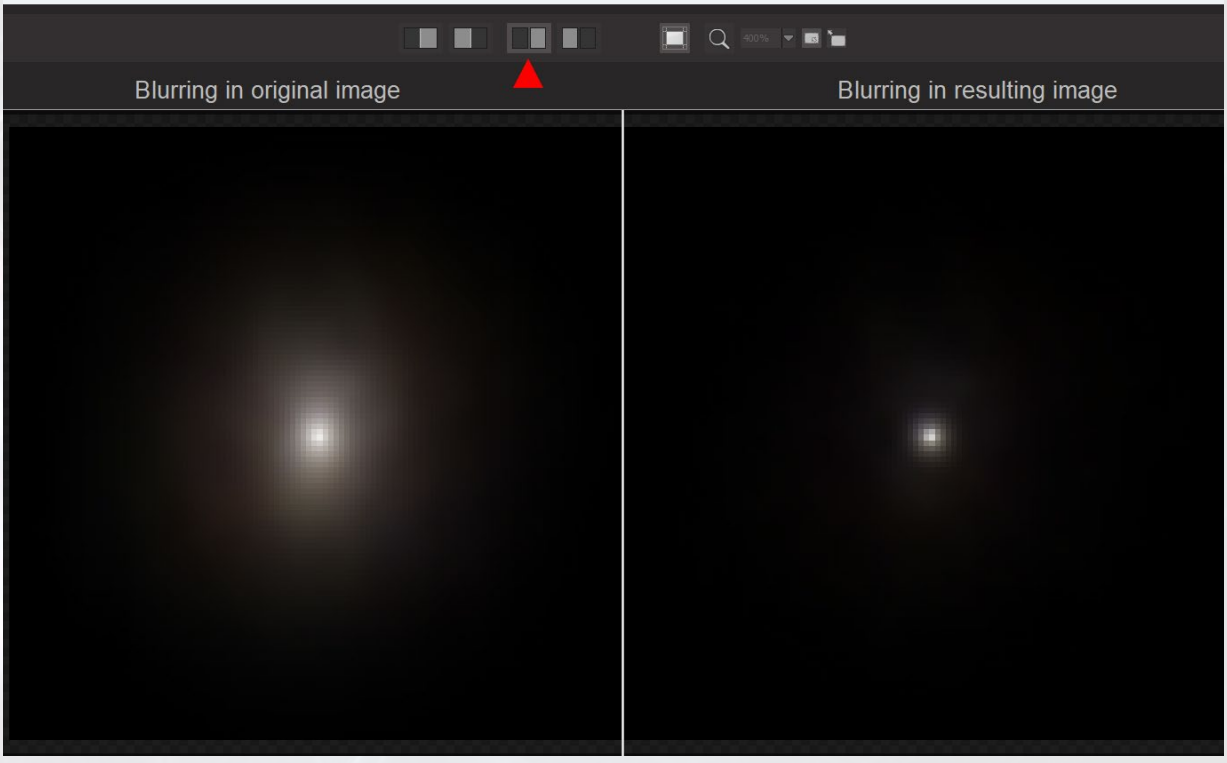
- **Precision:** If you drag this slider to the right up to 200%, the **sampling accuracy** for calculating the blur distribution is increased and leads to an even more precise result.
- **Brightness/Contours**: For each image loaded, this module **automatically** analyses the **contours** of the image to determine whether the image is dominated by areas with **many** or **rather** few or soft contours. The result of the analysis determines the choice of modes and leads to better results thanks to the differentiation; if necessary, switch to **Brightness** (left) or **Contours** (right).

Great Blurring comparison view

Click on the button ...



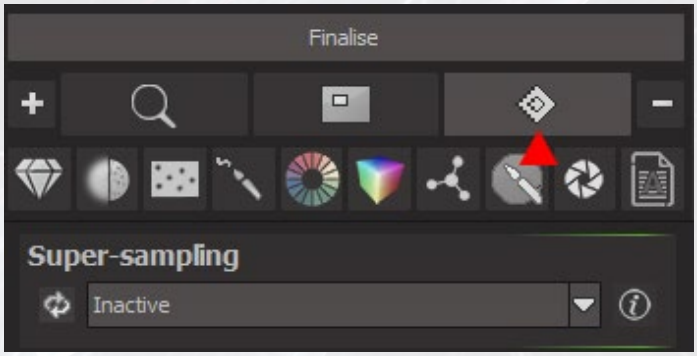
... opens the window with the **Blurring comparison view** between the original and the sharpened result image.



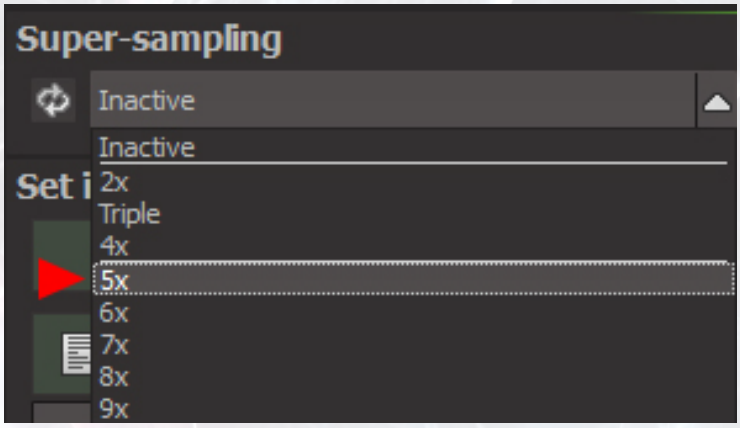
The toolbar at the top can be used to change the display as shown in the graphic, where the **same image section** with the original (left) and the sharpened result (right) is shown on the left and right.

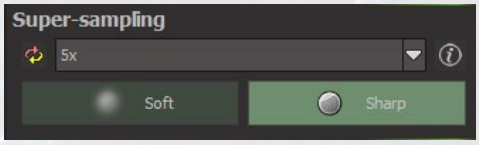
17. Super-sampling area

Super-sampling is a very special, quality-enhancing function that adds the finishing touches to the image and **should therefore come at the end of all automatic and/or customised sharpening**.
This **scaling technology**, a combination of edge smoothing and halo reduction, is characteristic of super-sampling and leads to high-quality resulting images with more pleasant, smoother and more harmonious sharpening.
Super-sampling is a stand-alone module because it can also be used as a finishing touch for other image modifications.



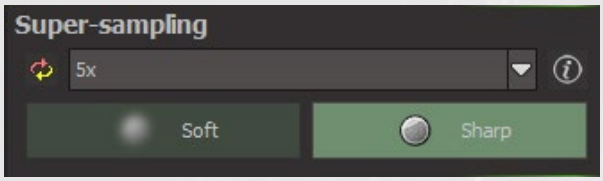
Click on the symbol in the toolbar to display it.
Activate super-sampling: Super-sampling is activated when you click on the **Inactive** button or the small arrow to the right of it ...

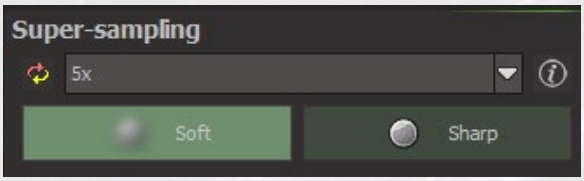




... and select one of the available super-sampling levels. This selection initiates the **internal upscaling of an image by the selected factor. The resulting image is then sharpened with all the selected settings and then reduced back to its original size**. In the case of 2x scaling, the image is enlarged to twice its original size; in the case of 3x or 4x scaling, the image is enlarged to the corresponding size and then reduced again, resulting in impressive images.

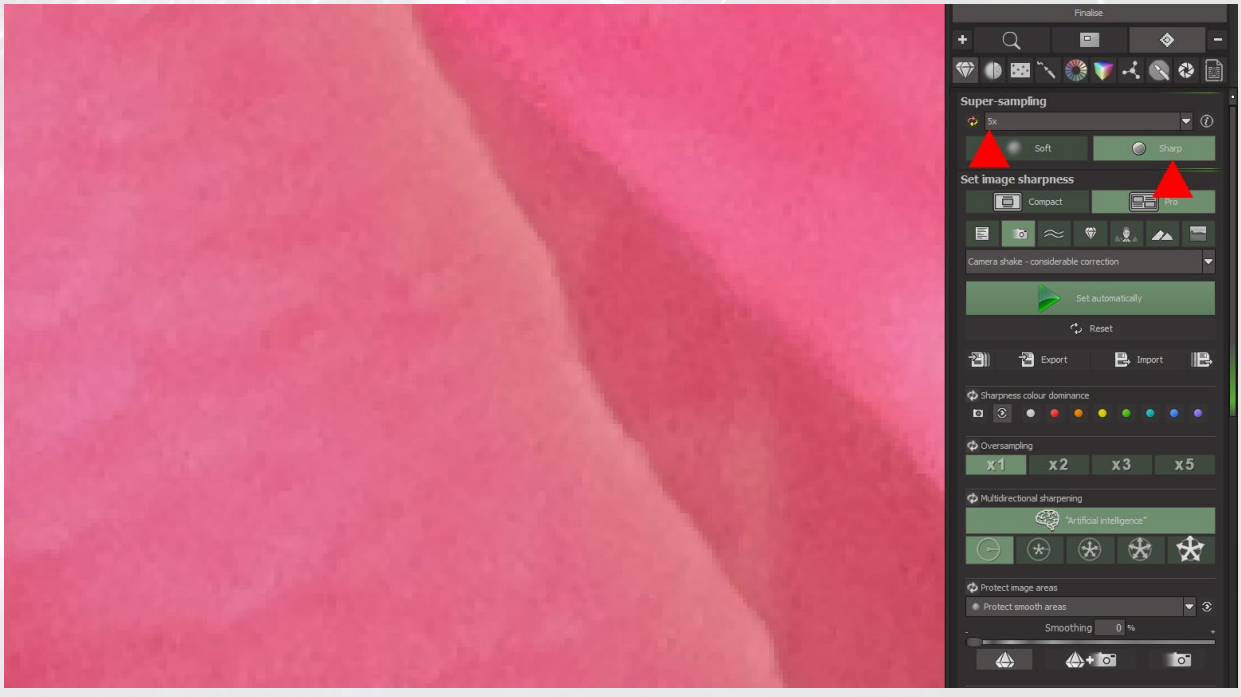
2 buttons





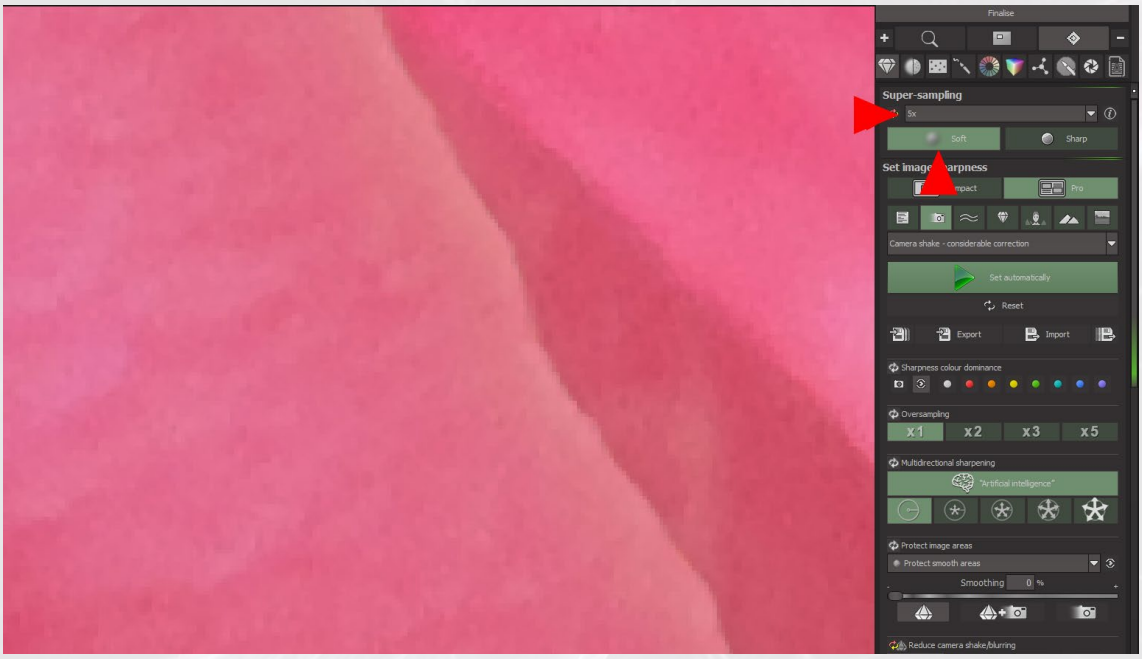
2 modes: Sharp and soft: The default mode **Sharp** (graphic on the left) ...

produces a strong correction compared to **sharpening without super-sampling**, such as **camera shake – strong correction** (graphic on the right) ...

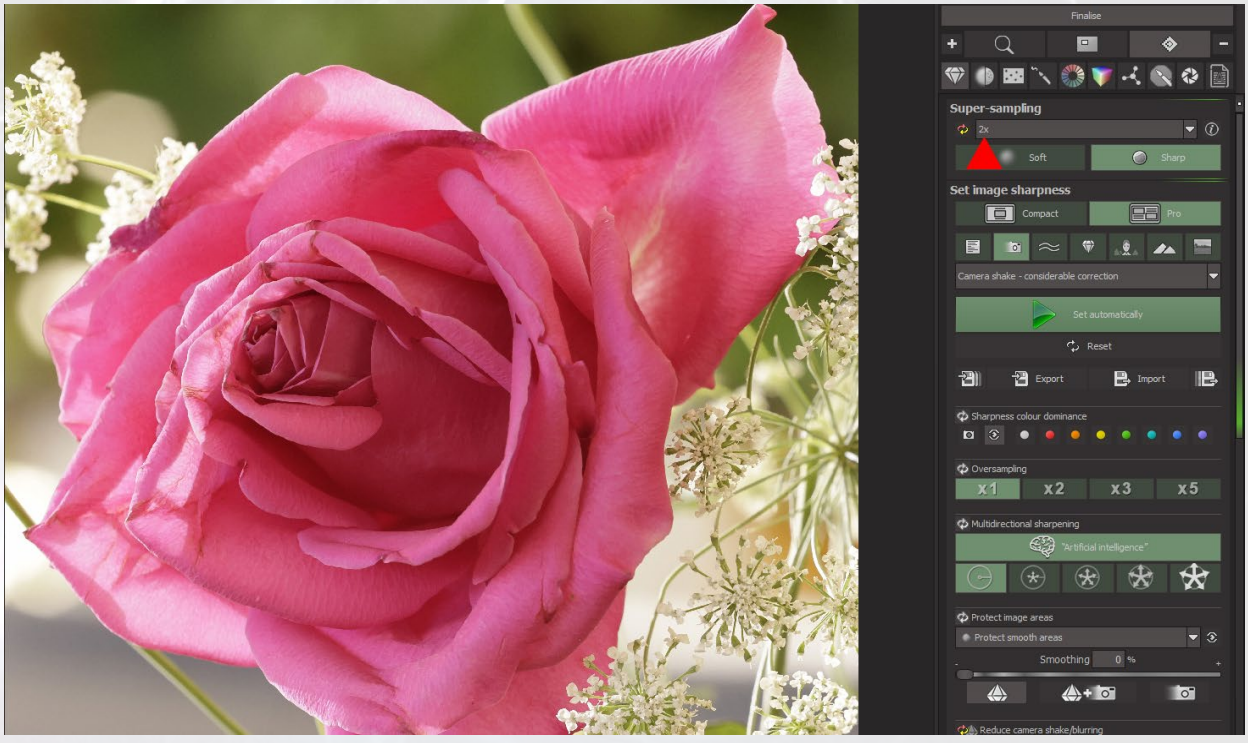


... very clear and homogeneous contours and is particularly suitable for images with many micro details.

Mode **Soft**



In **Soft** mode, the interpolation (determined approximately) is somewhat softer, which produces very homogeneous surfaces and contours, is more suitable for soft subjects and leads to a somewhat smoother result.
The same motif has been selected here for better comparability.
Note: Sharp and Soft do not refer to **sharpening**, but to **the scaling method** used in these modes.



Even if **5x super-sampling** was selected in the image example above, **2x to 3x** is usually sufficient for an impressive result image, as here with the same subject, and is achieved with a significantly shorter calculation time.

18. Example of an extended workflow in keywords

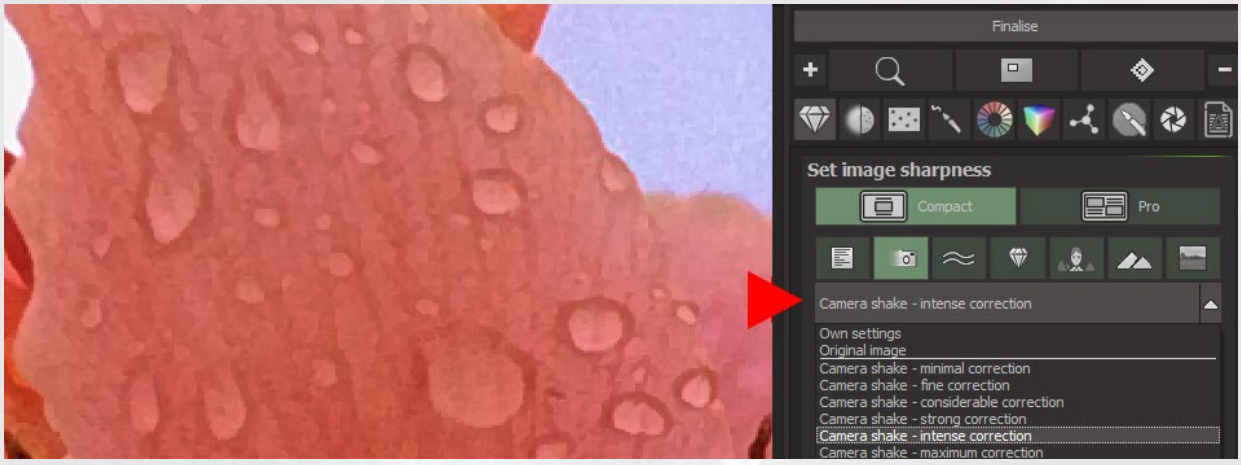
At the beginning of this guide, the flash workflow showed how you can achieve great results literally in a flash using the automatic mode. The following chapters have shown numerous other possibilities for optimisation or adaptation to personal taste.
The following brief overview can provide guidance for an 'extended' workflow, which is of course only a suggestion and not binding.
The first two steps are identical to the flash workflow.

Step 1: Load image, activate a preset of your choice if required.

Step 2: Select the sharpness category depending on the subject and trigger the automatic function. In the example, this is the 2nd category **Shake & blurring**, the automatic has selected **camera shake - strong correction.**

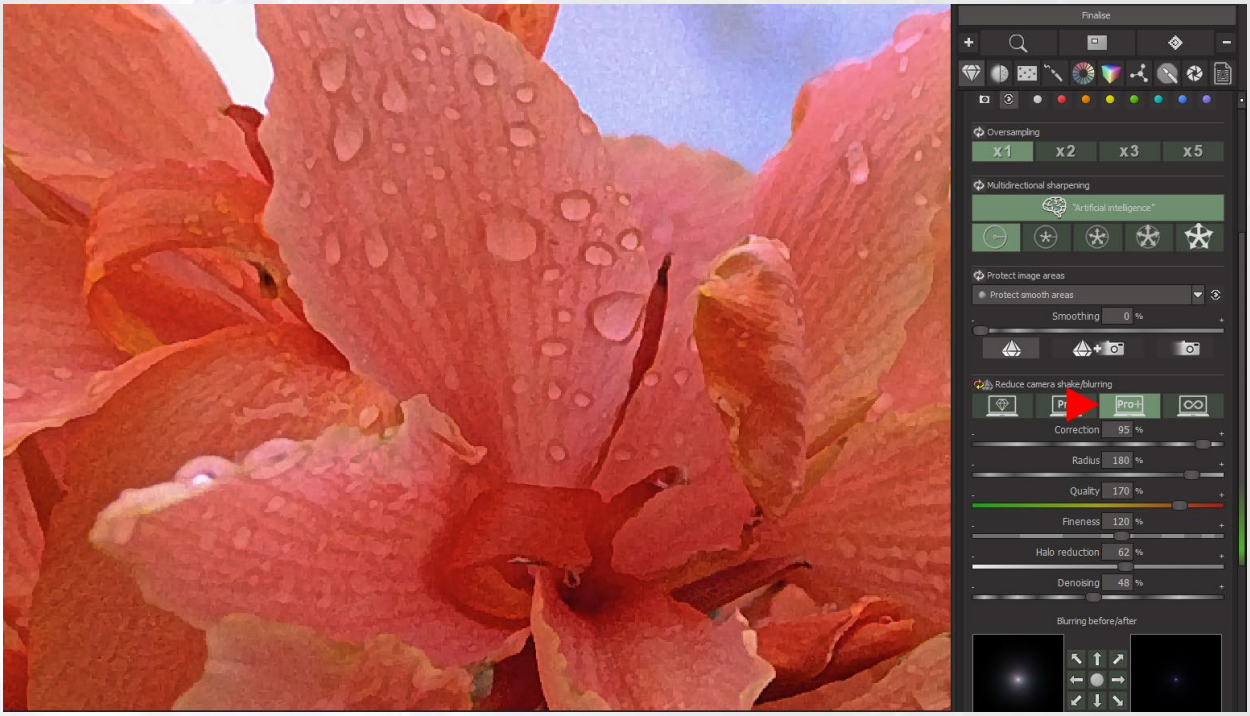
For a portrait, this can be the **Portrait** category. Here the **Portrait - intensive sharpness** automatic has been selected.

Step 3: Select other presets: Zoom in on a 'critical' part of the image to better assess the sharpness result ...



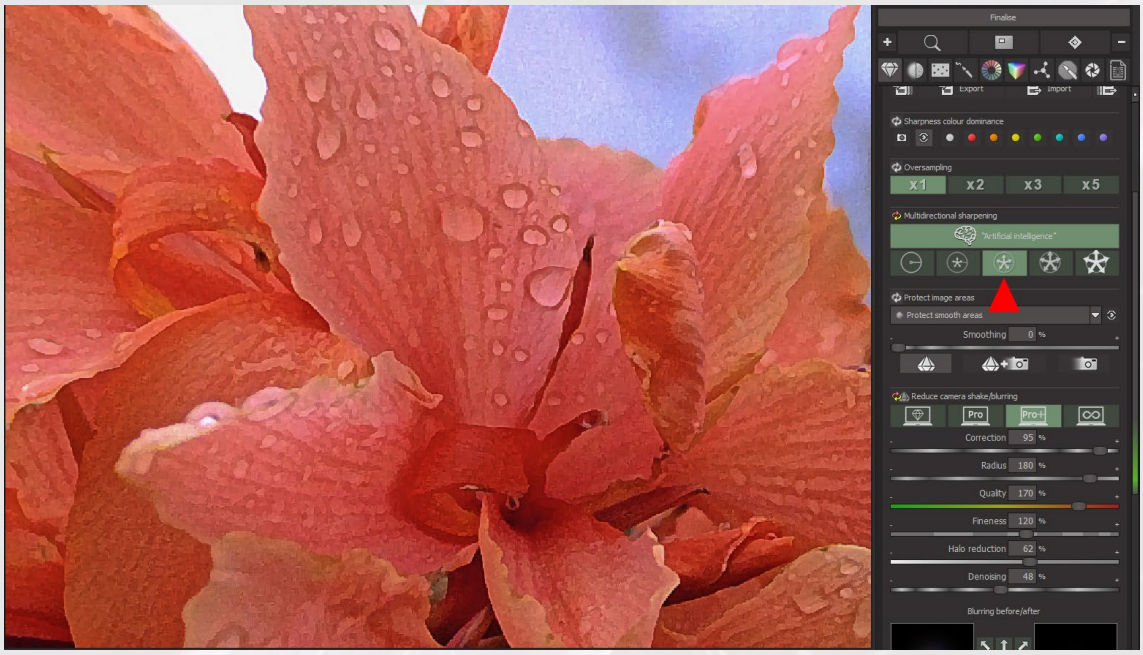
... and, if required, select the preset one or two levels lower or higher, in the example from **camera shake- strong correction** one level higher to **camera shake - intense correction**. The image is immediately automatically sharpened with the currently selected preset without having to click the automatic button again.

Step 4: Increase the sharpness even further: If even more sharpness is required individually, ...



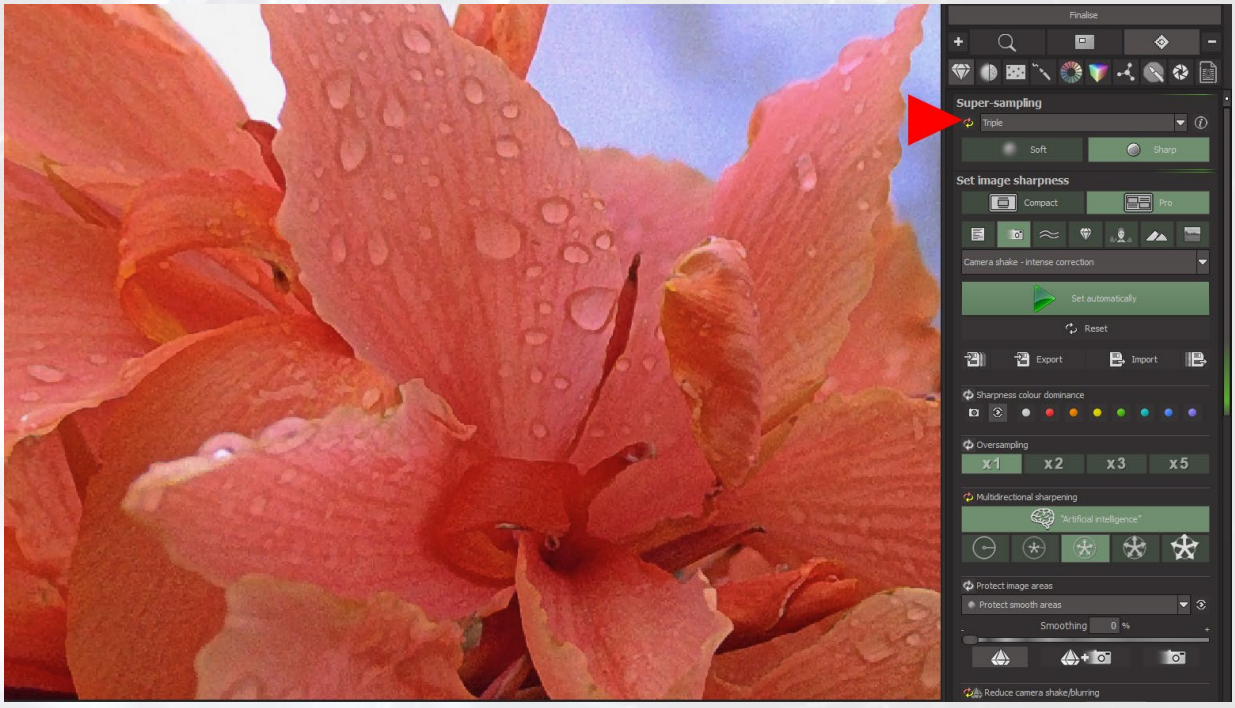
... increase the **quality** level, in the example to **Pro +,** or/and experiment with the sliders below until the result meets or comes closer to your expectations.
Note: When switching to the **Pro** user interface, **6 instead of 3** are displayed in the compact interface.

Step 5: Multidirectional sharpening (optional)



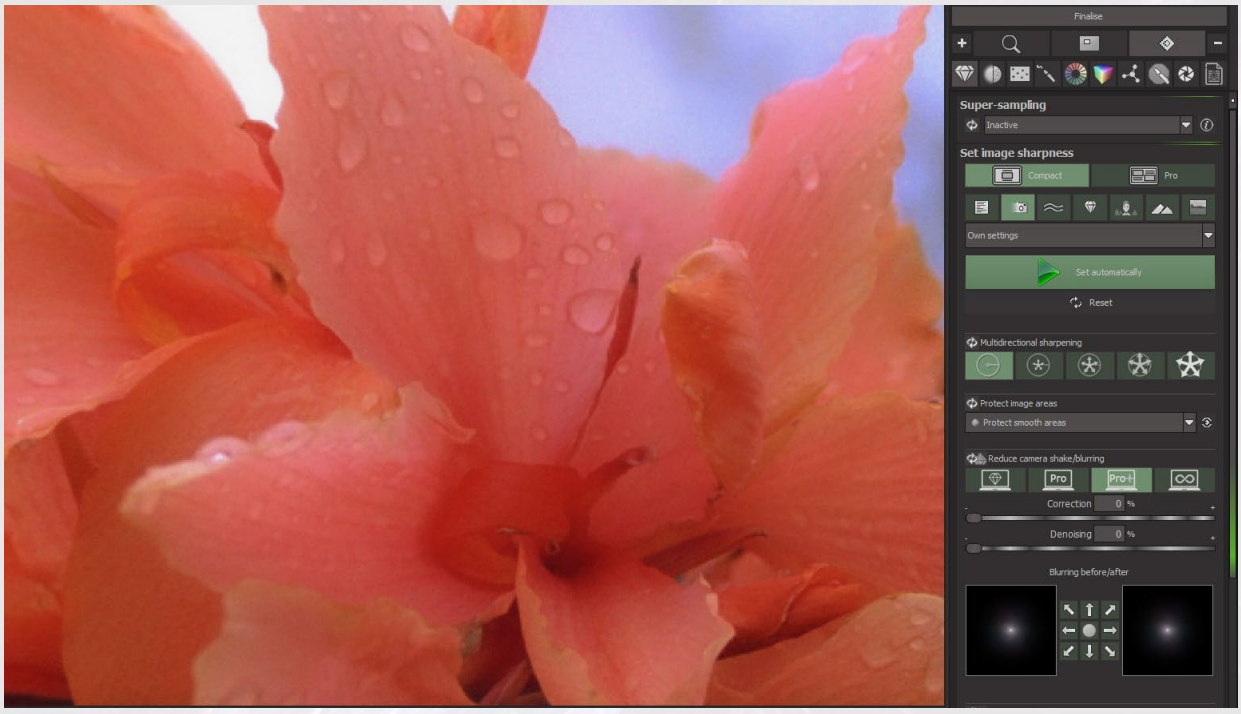
In the penultimate step, activate the multi-directional sharpening if required, in the example with a medium radius, and decide whether this sharpening or one with a lower or higher radius improves the result in your favour. As in the example, this is often particularly recognisable in the contours.

Step 6: Supersampling

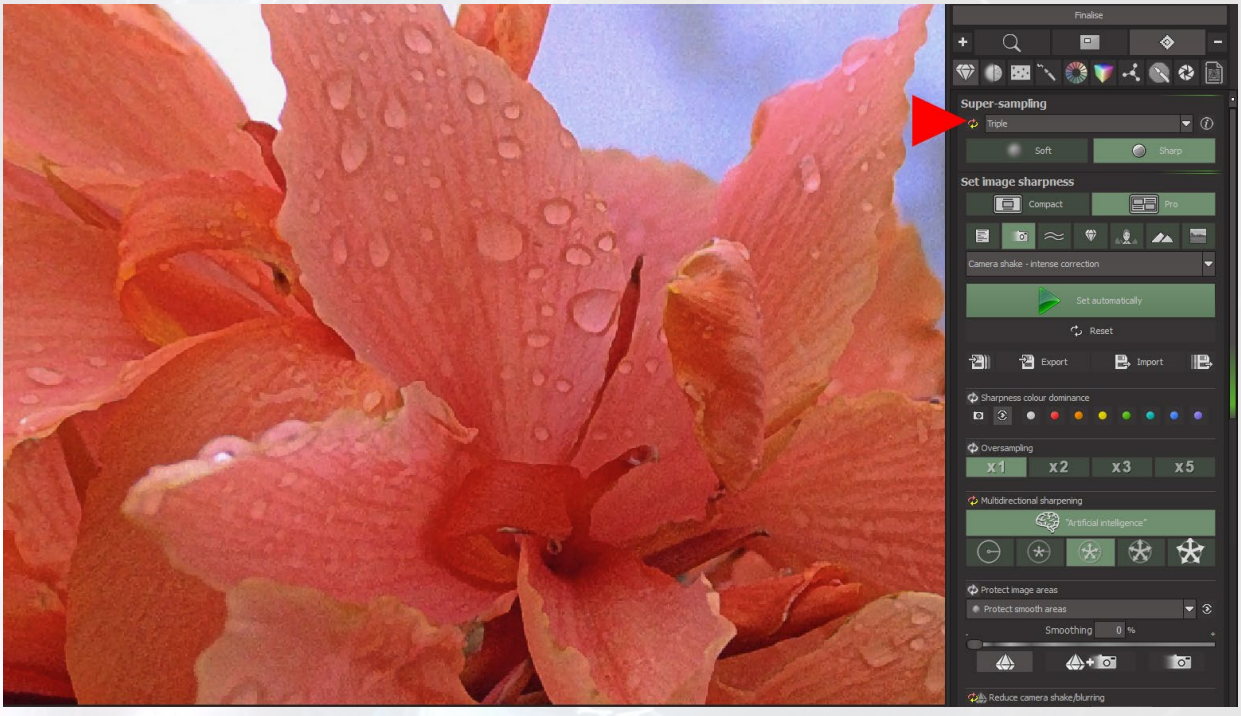


This final step is useful in most cases to make the image appear more homogeneous and simply ‘better’ overall after all the sharpening. As a rule, the **2nd or triple level** is sufficient, as in the example.

Before - After – Comparison



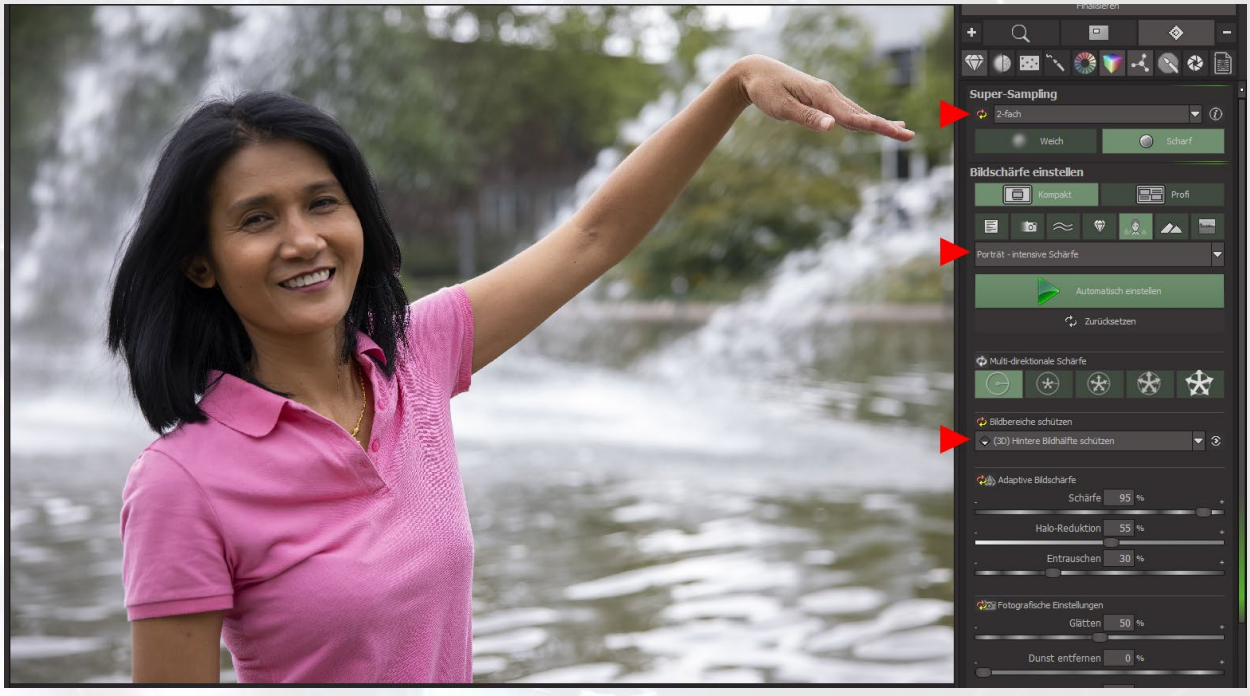
The comparison of the enlarged section of the **unsharpened original** ...



... to the **final result image** impressively demonstrates the performance of **SHARPEN** and the options for achieving very good result images with the automatic system or for further optimising or refining these results with individual interventions if required.

Before - After - Portrait comparison

In the case of the unsharpened portrait, the automatic system had suggested the **intense sharpness** in the selected **portrait** category.



With this **adaptive sharpening method**, this ‘intermediate result’ was already so convincing that only the area protection was changed to **(3D) Protect rear half of image**, because the background was deliberately left out of focus. After switching on **supersampling in the 2nd stage**, the final resulting image looks even more harmonious and leaves nothing to be desired.