

Graide



Color Match

User Manual

Graide Color Match User Manual

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Graide Color Match

Graide Color Match is a powerful tool for matching the color and brightness of different video clips or still images. **Graide Color Match** enables you to:

- match shots that have been recorded with different cameras, different camera settings, or different lighting conditions,
- use color reference charts for matching shots,
- even out brightness and color changes over the course of a shot, and
- transfer color and brightness from one shot to another.

The following sections describe the [installation](#), the [color match process](#) and the [user interface](#) of the plugin. If you prefer to jump right in, you'll find [step by step instructions](#) for matching shots at the end of this manual. If you have further questions, comments, or suggestions, please contact me at mwoerner@semw-software.com.

-  This document shows icons as they appear in Vegas™ Pro and Movie Studio 12 Platinum. The icons in Movie Studio 13 Platinum look a little different. Also, the *Copy Snapshot to Clipboard*  button is missing from the preview window in the “Simple” mode of Movie Studio 13 Platinum. Instead, you can copy frames by right-clicking the preview window and selecting *Copy Snapshot to Clipboard* from the context menu.

Before you begin

2.1 System requirements

- Sony® Vegas™ Pro 10, 11, 12 or 13 (64 bit) or Sony® Movie Studio 12 Platinum or 13 Platinum (64 bit)
- Microsoft® Windows® Vista, 7, 8 or 8.1 (64 bit)
- Microsoft® .NET-Framework 4.0 or higher
- CPU with SSE2 (Intel® Pentium® 4/AMD Athlon™ 64 or better)
- 2 MB free hard disk space

2.2 Installation

Graide Color Match comes with an automatic setup program, which will install the plugin and register it with Sony® Vegas™ Pro and Sony® Movie Studio Platinum. Download and run the setup file from <http://www.semwsoftware.com> and follow the instructions. Once **Graide Color Match** is installed, it is available in all supported 64 bit installations of Sony® Vegas™ Pro and Sony Movie Studio Platinum.

2.3 Using the plugin

As a video effect, **Graide Color Match** can be used in four different contexts:

- As a video event effect, which acts on a video event in the timeline. To add a video event effect, click the *Event FX* icon  on the event.
- As a video track effect, which acts on a video track and thus on all events it contains. To add a video track effect, click the *Track FX* icon  in the track header.
- As a video output effect, which acts on the video output and thus on all video tracks and events. To add a video output effect, click the *Video Output FX* icon  in the preview window.

- As a media effect, which acts directly on project media. To add a media effect, right-click an item in the *Project Media* window and select *Media FX...* from the context menu.

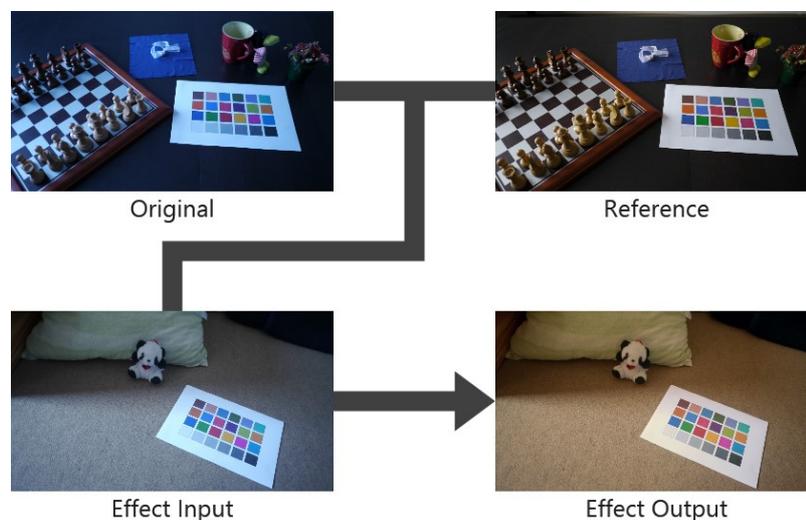
It is also possible to drag the **Graide Color Match** item from the *Video FX* window (*View/Window/Video FX* or *View/Video FX*) onto an event, a track, or the preview window.

2.4 Uninstallation

Like most programs, **Graide Color Match** can be uninstalled in the *Programs and Features* section of the Windows® Control Panel. Select *Graide Color Match* in the list of installed programs and click *Uninstall*.

Matching color with Graide Color Match

Matching shots with **Graide Color Match** involves four images:

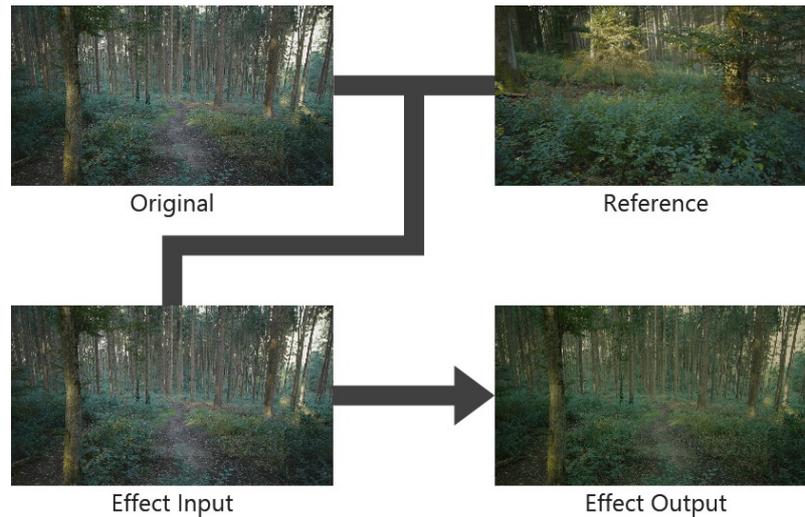


The **Original** and **Reference** images determine the color correction that is to be applied. **Graide Color Match** computes a correction that would adjust the Original image to match the Reference image.

The **Effect Input** is the frame that Vegas™ sends to the plugin. If **Graide Color Match** has been applied as a video event effect, for example, this is the current video frame of the event.

The **Effect Output** is the frame that **Graide Color Match** sends back to Vegas™. It is the result of applying the color correction computed from the Original and Reference images to the Effect Input image. In the example above, the Effect Output has warmer colors than the Effect Input because the Reference image is warmer than the Original image.

In practice, you will often want to match one clip to another. In this case, select a representative frame of the clip to be corrected as the **Original** image. **Original** and **Effect Input** will then be similar or even identical:



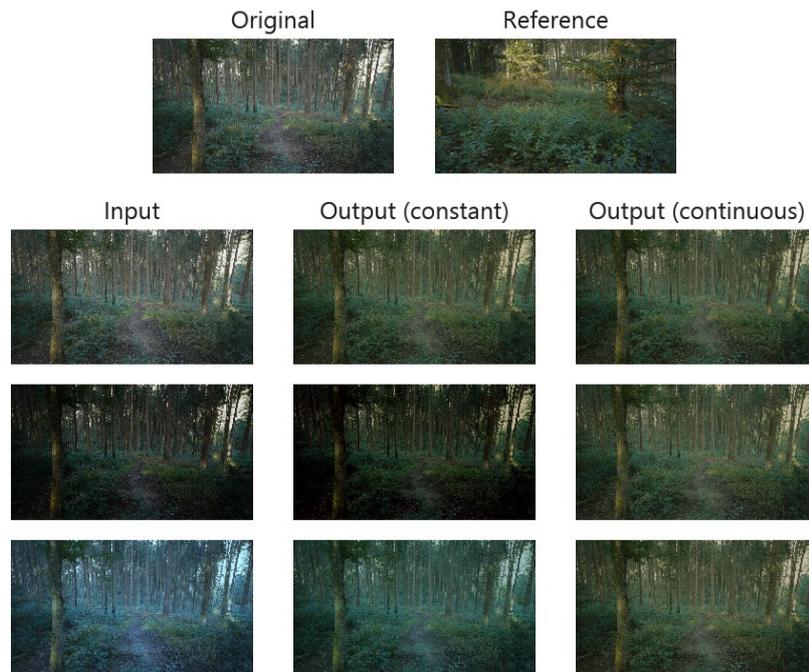
- 💡 When matching images of different brightness, you will often get better results by adjusting the brighter image to match the darker one. This prevents an excessive brightening of the darker image, which would also increase the visibility of noise and compression artifacts.

3.1 Constant and continuous correction

In the default mode, **Graide Color Match** performs a **constant correction**. This computes a one-time correction that is then applied to all input images. This retains color and brightness variations over the course of a clip and changes in image content will not prompt an automatic readjustment of the correction. The constant correction is similar to switching to a different light configuration in a theater scene: The lighting changes irrespective of what happens on the stage.

The alternative to a constant correction is a **continuous correction**. In this mode, there is no Original image and **Graide Color Match** regards the current Effect Input as the Original that is to be matched to the Reference image. As a result, each frame of a clip receives an individual correction. The correction may thus change over the course of the clip depending on how much the current Effect Input frame differs from the Reference image. In the best case, this evens out color and brightness variations in the clip entirely. The continuous correction can be compared to an automatic mode of a camera, which adjusts white balance and exposure based on image content. (Note, however, that the readjustment done by **Graide Color Match** - in contrast to that of a camera - has no inherent delay).

The following figure tries to clarify the difference between these two approaches. The left column (“Input”) shows three Effect Input images that differ in color and brightness. The center column (“Output (constant)”) shows the result of a constant correction with the Original and Reference images shown at the top. The right column (“Output (continuous)”) shows the result of a continuous correction with the given Reference image.



While the constant correction leaves color and brightness changes in the Input clearly visible, the continuous correction eliminates them almost entirely. Which of these methods should be used depends on what is to be achieved with the color correction.

- Use the constant correction to even out differences between shots, such as when
 - the shots were recorded at different times of day or under different weather or lighting conditions or
 - the shots were recorded with different cameras, filters, or camera settings.
- Use the continuous correction to even out variations within a shot, such as when
 - exposure or white balance have been readjusted automatically during the shot,
 - the lighting conditions changed during the shot, or

- you deliberately changed the aperture, shutter speed or ISO sensitivity during the shot to correct for over- or underexposure.

3.2 Analysis area

Graide Color Match determines the required correction by comparing color and brightness in the Original and Reference images (or in the case of a continuous correction in the Effect Input and Reference images). By default, the entire image is included in this comparison. This approach may not produce satisfactory results when the content in the Original and Reference images differs a lot and any measured differences may result from this difference in image content rather than from a difference in the lighting conditions. Consider the following example:



Here, the strong contrast and cool colors in the Effect Output are caused by the different image content rather than by different lighting. In order to better handle such cases, **Graide Color Match** enables you to restrict the image analysis to only a part of the image. If you select image areas with similar content, it may well be possible to derive a correction that is appropriate for the whole frame. In this example, selecting a suitable analysis area is very simple because both images contain a color reference chart. Restricting the image analysis to the areas of the reference charts produces the following result:



Whenever matching colors between different images does not produce satisfactory results, you can use the analysis area to influence and improve the analysis. You don't necessarily need a color reference chart to successfully use the analysis area. All characteristic similarities (such as prominent items visible in both images) may be suitable choices. For example, you may have recorded a scene from different angles and may be able to select what is visible in a close-up in the wide shot.

Even when there are no distinct similarities, it may be worth experimenting with the analysis area and manipulate the color correction by including or excluding certain parts of the image in the analysis.

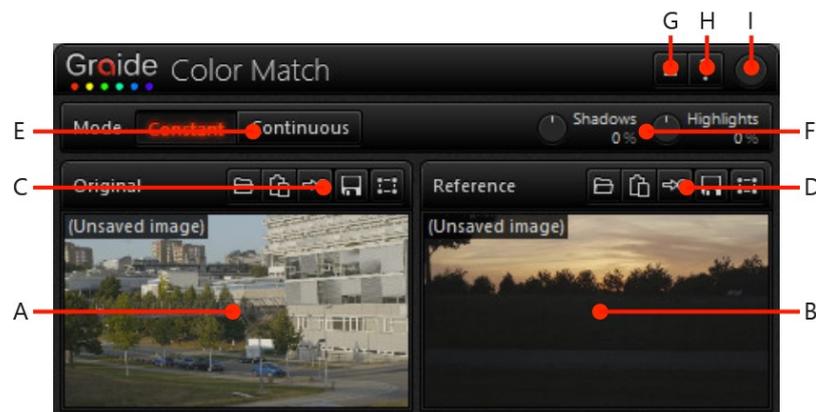
If you plan to use a reference chart, make sure that it covers a wide dynamic range and includes color patches of different shades from black to white. Patches with different combinations of the three primary colors red, green, and blue can be helpful, too. The arrangement of the patches on the chart does not matter, as long as you use the same reference chart in both the Original and the Reference image.

If you define an analysis area in continuous mode, it will be used for both the Reference and the Effect Input image.

The user interface

The user interface is displayed when you first add a **Graide Color Match** effect or reopen the FX window at a later time. This is where you set all parameters of the correction.

- i** In Vegas™ Pro 10, the user interface is located under the *Custom* tab in the FX window.



- A:** Original image, **B:** Reference image, **C:** Original image command bar, **D:** Reference image command bar, **E:** Mode, **F:** Shadows and Highlights, **G:** Settings, **H:** Help, **I:** Effect strength.

- i** Depending on the available space, the two images may be displayed in a vertical rather than a horizontal arrangement.

4.1 Original and reference image

A large part of the user interface is covered by the two images that determine the color correction (as described in [Matching color with Graide Color Match](#)). A label in the top left corner of each image display shows the name of the file from which the image was loaded. If the image was not loaded from a file, (*Unsaved image*) is displayed here.

-  The continuous correction does not use an Original image, so only the Reference image is displayed in continuous mode. If you switch to continuous mode with only an Original image defined, **Graide Color Match** will automatically use this image as the reference.

If no image is available, one of these text messages is displayed instead:

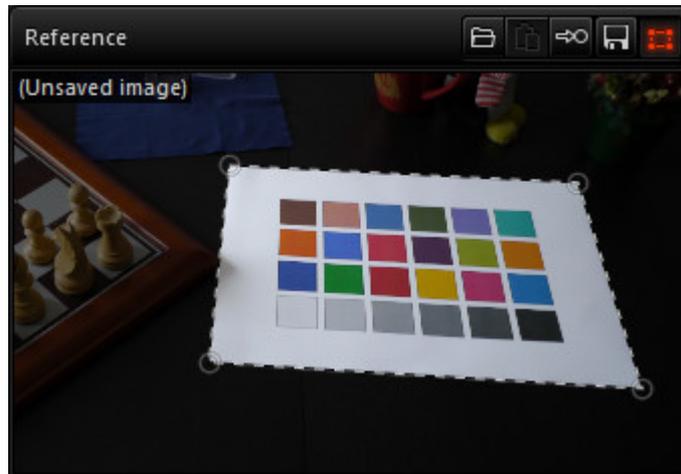
Message	Description
No image selected	No Original or Reference image has been selected yet, so no color correction can be computed. Use one of the buttons in the image command bar to open or paste an image.
Image file missing	The file from which the Original or Reference image was loaded is no longer available. No image is displayed and the analysis area cannot be changed, but the color correction continues to work based on the stored analysis results.
Image data released	The image data is no longer available because the program was restarted or the image memory has been released. No image is displayed and the analysis area cannot be changed, but the color correction continues to work based on the stored analysis results. This is further explained in Managing original and reference images .
Waiting for input image	If you click the <i>Copy input frame</i> button in the image command bar but no Effect Input image is currently available, Graide Color Match waits until an Effect Input becomes available and displays this message in the meantime. Make sure that the conditions listed under Copy

input frame are met or click *Copy input frame* again to cancel the wait and keep the current image.

If no **analysis area** has been set, you can interact with the image display in the following ways:

Function	Action
Pan view	Click and drag with the left or the middle mouse button.
Zoom view	Use the mouse wheel.
Reset view	Right-click and select <i>Show whole image</i> from the context menu.

If an analysis area is active, its four corner points are displayed on the image as little circles. The parts of the image outside the analysis area appear darkened.



With the analysis area active, you can interact with the image display in the following ways:

Function	Action
Pan view	Click and drag with the middle mouse button. <i>or</i> Click and drag outside the analysis area with the left mouse button.

Zoom view	Use the mouse wheel.
Reset view	Right-click and select <i>Show whole image</i> from the context menu.
Move corner point	Click and drag the corner point with the left mouse button.
Move entire analysis area	Click and drag inside the analysis area with the left mouse button.
Reset analysis area	Right-click and select <i>Reset analysis area</i> from the context menu.

-  After moving a corner point, **Graide Color Match** may change the order of the corner points to ensure that the resulting quadrangle does not overlap itself.

4.2 Image command bar

Above each of the images, there is a command bar with the following icons:

Icon	Description
	Open image file loads an image from a file (BMP, GIF, JPEG, PNG or TIF) and uses it as Original or Reference image.
	Paste image inserts an image from the Windows® clipboard as Original or Reference image. By copying and pasting, you can easily use any image from the preview or trimmer window as Original or Reference image. This button is disabled if there is no image in the clipboard.
	<p>Copy input frame captures the current Effect Input as Original or Reference image. The availability of an Effect Input image depends on a few factors:</p> <ul style="list-style-type: none"> • The preview window must be visible and the <i>Split Screen View</i>  (Vegas™ Pro only) in the preview window must be disabled. • The Graide Color Match effect must not be bypassed in its effect chain, i.e. the box next to the effect must be checked.

- The effect of **Graide Color Match** must currently be visible in the preview window. This means that:
 - If the effect has been applied to a video event, the timeline cursor must be placed over this event.
 - If the effect has been applied to a video track, the timeline cursor must be placed at a point where this track is not empty.
 - The affected video events and tracks must not be muted.

While no Effect Input is available, **Graide Color Match** displays “Waiting for input image”. Once an Effect Input becomes available, it is captured and the image appears. You can cancel the wait and continue to use the current image by clicking the *Copy input frame* button again.



Save image stores the current Original or Reference image in an image file (BMP, GIF, JPEG, PNG or TIF). This button is disabled when there is no current image.



Analyze area enables or disables the **analysis area**. This button is disabled when there is no current image or the image’s pixel data has been released (see **Managing original and reference images**).

-
- i** Images acquired via *Paste image* or *Copy input frame* are retained permanently only if they are saved with *Save image* (see **Managing original and reference images**).

4.3 Mode



The mode buttons switch between the **constant and continuous correction** modes.

4.4 Shadows and highlights



The **Shadows** and **Highlights** knobs adjust the brightness of the dark (Shadows) and light (Highlights) parts of the Effect Output. While you can easily adjust the Effect Output by inserting additional video effects after **Graide Color Match**, 8 bit projects will clip parts of the Effect Output that are too dark or too bright. Clipped values cannot be restored by effects further down the effect chain. The adjustment done by *Shadows* and *Highlights*, however, is done within **Graide Color Match** and thus before any clipping of the Effect Output.

To change the value of a knob, click and drag it with the left mouse button, place the mouse cursor over it and use the mouse wheel, or click on the current value and enter a new value.

4.5 Settings



The **Settings** button opens the settings window, where you can change the program language and unlock the **trial version**.

4.6 Help



The **Help** button opens the program help. Use the table of contents at the left side of the help window to jump to a topic. You can interact with the help window in the following ways:

Function	Action
Zoom	Use Ctrl+mouse wheel. <i>or</i> Press Ctrl++ or Ctrl+-.
Reset zoom to normal	Press Ctrl+0.
Find text	Press Ctrl+F.

Graide Color Match also has a context sensitive help feature, which takes you directly to the description of a user interface element. Follow these steps to access the context sensitive help:

1. Select *Help/What's This* in the main window of Vegas™ Pro or Movie Studio.

or

Click the *What's This Help* icon  in the Vegas™ Pro or Movie Studio toolbar.

or

Press Shift+F1.

or

Right-click the *Help* icon .

A question mark will appear next to the mouse pointer.

2. Click on an element of the **Graide Color Match** user interface.

4.7 Effect strength



Using the **Effect strength** knob, you can control how much the effect influences the input signal. With the default value of 100%, the effect processes the input normally. Values below 100% reduce the effect. At a value of 0%, the input image remains unchanged. Values above 100% increase the influence beyond the normal effect.

To change the value of the effect strength knob, click and drag it with the left mouse button or move the mouse pointer over it and use the mouse wheel. The knob shows a numeric display of its current value while the mouse pointer is over it.

You can also use the effect strength knob to correct two clips toward each other instead of adjusting just one and leaving the other unchanged.

Managing original and reference images

When you insert an image from the clipboard or the Effect Input, **Graide Color Match** keeps this image in memory and displays (*Unsaved image*) next to it. If you use multiple **Graide Color Match** effects in a project, the memory requirements of all effects add up.

Once an image has been analyzed, it is no longer needed except for displaying it and for changing the **analysis area**. Therefore, **Graide Color Match** will release images that have not been used for a while once the total memory consumption reaches a certain level. If you exit Vegas™ Pro or Movie Studio, this will also release all images.

When an image has been released, the color correction continues to work based on the stored analysis results. However, the images can no longer be displayed and their analysis area can no longer be changed. **Graide Color Match** displays the *Image data released* message instead of the image.

You can make an image permanently available by clicking the *Save image* button  and saving it to a file. **Graide Color Match** will then reload it from this file as needed.

Step by step instructions

6.1 How to match one video event to another

Suppose you've got two video events A and B in your timeline and want to match event A to event B. Follow these steps:

1. Add **Graide Color Match** as a video event effect to event A.
2. Set a frame from event A as the Original image. Follow these steps:
 - a Find a characteristic frame in event A and place the timeline cursor there.
 - b In the **Graide Color Match** user interface, click the *Copy input frame* button  in the command bar of the left image (Original).
3. Set a frame from event B as the Reference image. Follow these steps:
 - a Find a characteristic frame in event B and place the timeline cursor so that this frame can be seen in the preview window.
 - b In the preview window, click the *Copy Snapshot to Clipboard* button  to copy this frame to the clipboard.
 - c In the **Graide Color Match** user interface, click the *Paste image* button  in the command bar of the right image (Reference).

6.2 How to use a color reference chart to match one video effect to another

Suppose you've got two video events A and B in your timeline, want to match event A to event B, and a color reference chart is visible in both events. Follow these steps:

1. Add **Graide Color Match** as a video event effect to event A.
2. Set a frame from event A as the Original image. Follow these steps:
 - a Find a characteristic frame in event A and place the timeline cursor there.

- b In the **Graide Color Match** user interface, click the *Copy input frame* button  in the command bar of the left image (Original).
 3. Set the analysis area for event A to the color reference chart. Follow these steps:
 - a In the **Graide Color Match** user interface, click the *Analyze area* button  in the command bar of the left image (Original).
 - b Use the left mouse button to move the corners of the analysis area to the corners of the color reference chart in the image. For better precision, use the mouse wheel to zoom into the image.
 4. Set a frame from event B as the Reference image. Follow these steps:
 - a Find a characteristic frame in event B and place the timeline cursor so that this frame can be seen in the preview window.
 - b In the preview window, click the *Copy Snapshot to Clipboard* button  to copy this frame to the clipboard.
 - c In the **Graide Color Match** user interface, click the *Paste image* button  in the command bar of the right image (Reference).
 5. Set the analysis area for event B to the color reference chart. Follow these steps:
 - a In the **Graide Color Match** user interface, click the *Analyze area* button  in the command bar of the right image (Reference).
 - b Use the left mouse button to move the corners of the analysis area to the corners of the color reference chart in the image. For better precision, use the mouse wheel to zoom into the image.

6.3 How to even out exposure or white balance changes

Suppose you've got a video event in your timeline and want to even out illumination changes over the course of the event. Follow these steps:

1. Add **Graide Color Match** as a video event effect to the event.
2. In the **Graide Color Match** user interface, set the mode to *Continuous*.
3. Set a frame from the event as the Reference image. Follow these steps:
 - a Find a frame with the correct exposure and white balance in the event and place the timeline cursor there.
 - b In the **Graide Color Match** user interface, click the *Copy input frame* button  in the image command bar.

6.4 How to use a frame from the trimmer as Original or Reference image

You can transfer the current frame from the trimmer window to **Graide Color Match** by copying it to the clipboard and pasting it into **Graide Color Match**. Follow these steps:

1. **If the trimmer option *Show Video Monitor* is enabled:** Right-click the displayed trimmer image and select *Copy Snapshot to Clipboard*.
2. **If the trimmer option *Show Video Monitor* is disabled:** In the preview window, click the *Copy Snapshot to Clipboard* button .
3. In the **Graide Color Match** user interface, click the *Paste image* button .

6.5 How to match two video events to each other

Suppose you've got two video events A and B in your timeline and don't want to match one event to the other but apply a correction to each event that reduces the visual difference between them without having too extreme an effect on either one.

Apply **Graide Color Match** to each event to match it to the other one, then reduce the effect strength of both effects. Follow these steps:

1. Add **Graide Color Match** as a video event effect to both events.
2. Choose a characteristic frame from event A and set it as the Original image of event A and the Reference image of event B. Follow these steps:
 - a Find a characteristic frame in event A and place the timeline cursor so that this frame can be seen in the preview window.
 - b In the preview window, click the *Copy Snapshot to Clipboard* button  to copy this frame to the clipboard.
 - c In the **Graide Color Match** user interface for event A, click the *Paste image* button  in the command bar of the left image (Original).
 - d In the **Graide Color Match** user interface for event B, click the *Paste image* button  in the command bar of the right image (Reference).

3. Choose a characteristic frame from event B and set it as the Reference image of event A and the Original image of event B. Follow these steps:
 - a Find a characteristic frame in event B and place the timeline cursor so that this frame can be seen in the preview window.
 - b In the preview window, click the *Copy Snapshot to Clipboard* button  to copy this frame to the clipboard.
 - c In the **Graide Color Match** user interface for event A, click the *Paste image* button  in the command bar of the right image (Reference).
 - d In the **Graide Color Match** user interface for event B, click the *Paste image* button  in the command bar of the left image (Original).
4. Use the *Effect strength* knob  in the **Graide Color Match** user interface to reduce the effect strength of both events to 50%. You can try other values as well.

Trial and full version

Right after being installed, **Graide Color Match** will act as a trial version. The trial version has a time limitation but is otherwise unrestricted. You can check the remaining trial time in the *About* section of the *Settings* window.

After purchasing a license, you will receive a license key to unlock the trial to a full version. Click the *Unlock* button in the *About* section of the *Settings* window to enter your license key. If your trial version has already expired, you will be presented with an unlock option right after opening the **Graide Color Match** user interface.