



StereoMerger v.1.x

User manual

Dokument version 0.9

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1 Welcome to StereoMerger

Thank you for your interest in StereoMerger!

Making this software took the better part of a year. A lot of thought have been put into it. Many things had to be learned, many things had to be done, redone and rethought. There has been many challenges to overcome. Especially the juggling between this, my daywork, family and friends. I am ever so gratefull to my lovely wife who accepted this project!

Even though I've been a professional software developer for 10 years, and a hobby-developer for the 10 years before that, this is my first real personal public software release. I am very excited, and I hope you will find this software to your liking!

If you have any comments, wishes or good ideas, don't be afraid to contact me!

Best regards

Geir Øyvind Vælidalo

2 What is StereoMerger?

StereoMerger runs on both Windows and Mac OSX using Suns Java-technology.

Digital stereoscopic images, or stereo-images for short, can be captured in many ways. Among the most widespread methods are the standard single-lens camera (using either a slide bar, or simply the cha-cha method), beam-splitter and the dual camera rig. No matter which method you use, the work involving stereoscopic images is usually more than double the work, and double the complexity of regular images. This is where StereoMerger comes in.

Ok, so what is StereoMerger again? Well, I think it's hard to explain, so I have chosen a slogan which explains the essence. It goes like this:

«The digital stereoscopic photo lab».

It means that StereoMerger can digitally process your stereoscopic photos. This sounds dandy and all, but it doesn't really tell you much, right? Well, as I said, I think it's hard to explain what StereoMerger really is. It is like explaining a knife without having the word «knife». Imagine all the things you can do with a knife! Cutting, slicing, dividing, smearing, scraping, chopping, hacking, peeling etc. Just like a knife, StereoMerger can do a lot of stuff too - with stereoscopic images! And just like a knife, you can work with a bunch at a time if you like to.

In its heart, StereoMerger has an easy-to-use but truly powerful script-engine with almost endless possibilities. Scripts can be saved and later reused on single stereo-images or on batches of them. You can even share your scripts with your fellow stereo-photographers if you wish.

Scripts can consist of one or more filters. Filters is a wide term in StereoMerger, since it can be a real filter like a noise-filter, but also a frame, text or a histogram-operation. Even crop and rotation are called filters. StereoMerger has a (growing) number of filters to choose from, and with a little fantasy, one can make amazing results. These filters can in most cases replace image editors like Photo Shop!

When you apply a script, it will always be applied to the original stereoimage, and the filters will be applied in the order the filters are listed in the script. If you're not satisfied with the script, you can change, add, remove and/or reorder the filters until you're happy with it. Then, when you reapply the script, it will be reapplied to the original image and not to the resulting image from the previous run.

StereoMerger also have a fast and sturdy engine for finding matching stereo image pairs from sets of single images. Completely automated! For single- and dual-cam rig users, this should be a very welcomed feature!

The viewer/editor in StereoMerger let you view images using most of the known viewing methods. From the viewer/editor, you can easily create, test and execute scripts. The results can then be saved, if you wish. This is also the place for creating single stereoimages.

In addition to the regular viewer, StereoMerger also have a full resolution Super3DStation-compatible viewer with full stereo-jpeg support! And of course, you can now convert your strangely formatted S3DS images to the standard stereo-jpeg.

All in all, StereoMerger simplifies and minimizes the amount of work regarding stereoscopic images.

A typical process for making standard JPS stereoscopic images consist of these steps:

Steps	In StereoMerger
1) Taking the pictures	Not supported
2) Transferring pictures to computer	Semi automated
3) Finding matching pairs	Automated
4) Setting up pairs side by side	Automated
5) Adjusting stereo window, alignment, crop and more	Automated
6) Adjusting brightness, colour and more	Automated
7) Save new images	Automated

Of course, the automated parts can be done manually for total control.

Without StereoMerger, this can still be a fun and interesting job, for those who know they way around photo editors. But even for those, it's quite time consuming.

After having manually processed hundreds of pictures, things are starting to become routine. Boring routine. I tell you, this is not the way to spend your weekends and afternoons! Add anaglyphs to the equation, and the work amount grows exponentially. And maybe you want to put your pictures on the internet, so why not resize it and make a cross eyed version too?

With one script, which is included ty the way, StereoMerger can produce all the best known formats in one go. How about that? (Sounds like a TV-shop ad...)

So, do you have more knowledge about StereoMerger now? I do hope so ;-)

3 First time

When you start StereoMerger for the first time, there are some steps you have to go through.

3.1 *End user license agreement*

The first thing you have to do is to agree to the user license agreement (eula). If you disagree with the agreement-text, you can not use the program. The eula is some pretty straightforward stuff, which basically covers my behind and says that you take the full responsibility when running the program on your computer.

3.2 *License key registration*

After agreeing to the end user license agreement, you will be asked to locate your StereoMerger license-file. If you do not have one, you can do one of two things:

1. Buy one at <http://stereomerge.validalo.net>
2. Press cancel and use the unregistered version of StereoMerger

The unregistered version is fully functional except that you will find the text “Unregistered” on all the images you view or processes.

4 Main menu

The first thing you'll see, is the main menu. It consists of five buttons. Starting from the top left we have:

4.1 **Copy-button**

Easy file transfer from camera/memory card to computer

4.2 **Merge-button**

Automatic image matching, merging and processing function

4.3 **Batch-button**

Batch processing of stereoscopic images

4.4 **Viewer-button**

On screen viewing and editing

4.5 **Super3DStation**

A Super3DStation-compatible full resolution viewer with full stereo-jpg support. For more info about Super3DStation, visit <http://www.3dgv.com>. NB! StereoMerger have no association with 3D Good Vision.

4.6 **Language support**

Down to the left, you'll find a language selector. Currently only Norwegian and English is available. Please contact me if you want to translate to another language. No programming skills needed!

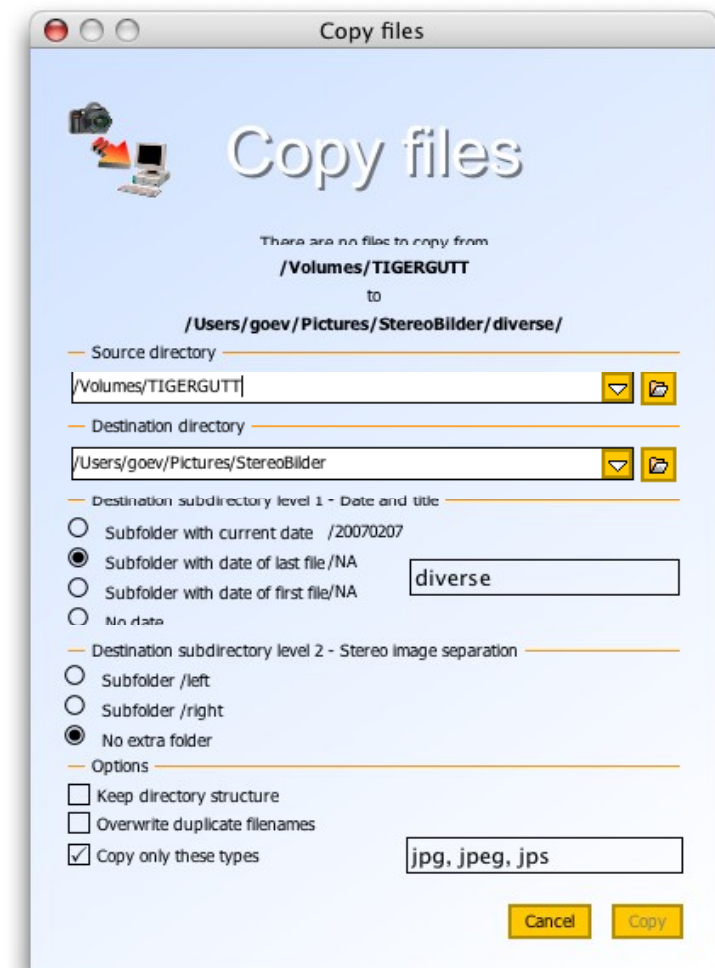


5 Copy files

This is the copy-dialogue. It can be opened up in two ways:

1. By pressing the copy-button in the main panel
2. By plugging in the camera or card-reader. This should work fine in most cases as long as the camera is in *Mass storage*-mode or similar. I.e not *PTP*.

The dialogue provides some basic copy and archiving functionality. The top-text in the dialogue should be pretty self-explanatory, but the main idea, anyhow, is to easily transfer images from your camera to a directory with a sensible name.



The destination directory can easily be built up using a combination of the image-dates and an editable text. In addition, a left and right directory can easily be chosen for each set of images from dual-cam rigs.

I archive my own images like shown in the frame to the right. This way it's really easy to sort the image folders chronologically.

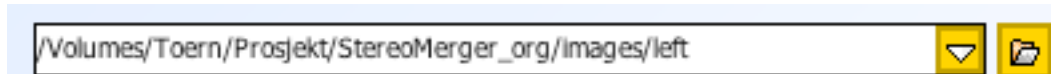
If you have any other needs, please send me an e-mail (geir@validalo.net) and I'll see what I can do!

If the destination path does not exist, it will be created.

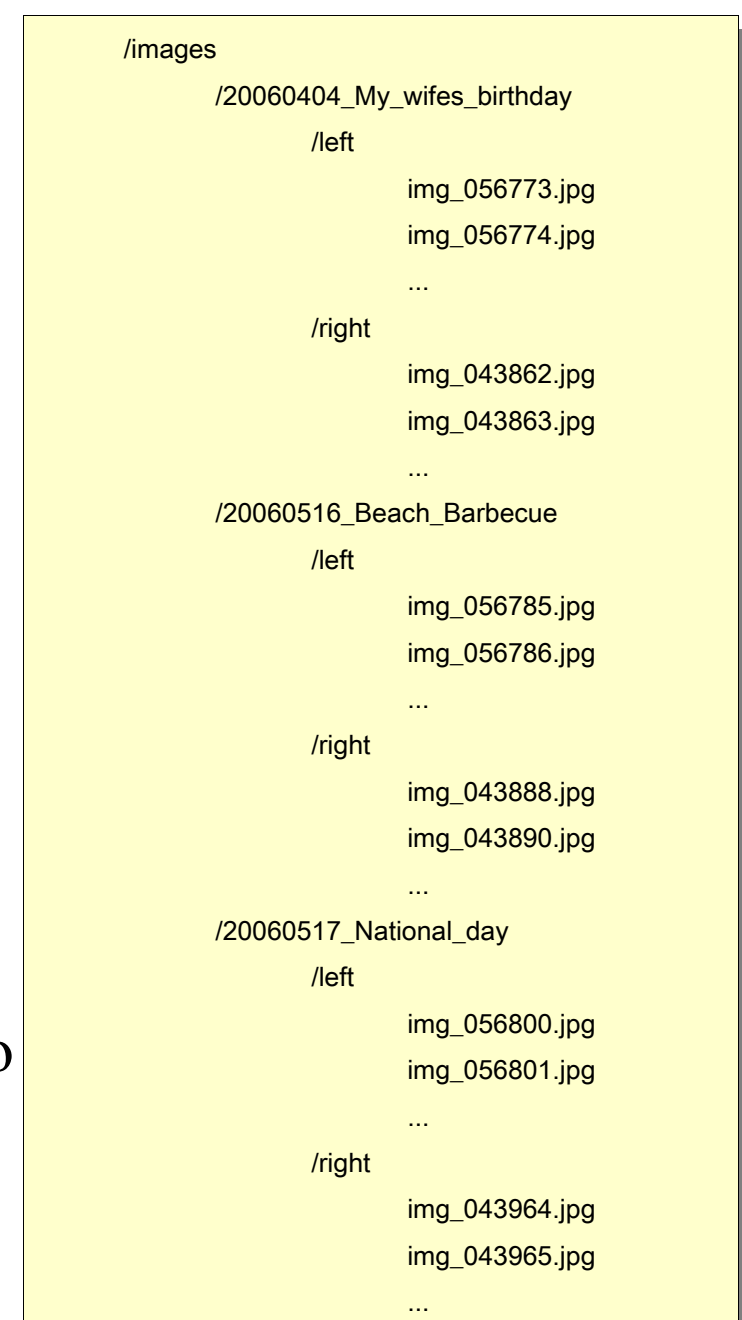
No image processing is done here. The original names and image dates are kept.

5.1 Quicklists

Quicklists are used in several places in StereoMerger. They consist of a drop-down list and a file browser-button.



The list contains the previous selected paths/files for easy retrieval. Paths can be selected from the list, typed into the field directly or chosen using the file browser.



6 Merge stereo pairs

If you have a dual-cam rig (a.k.a. twin cam) or a single camera with a slide bar, or simply uses the cha-cha method, you have to mount the images side by side. StereoMerger can do that almost completely automatically for you.

By pressing the merge-button() in the main menu, you start the merge-process.

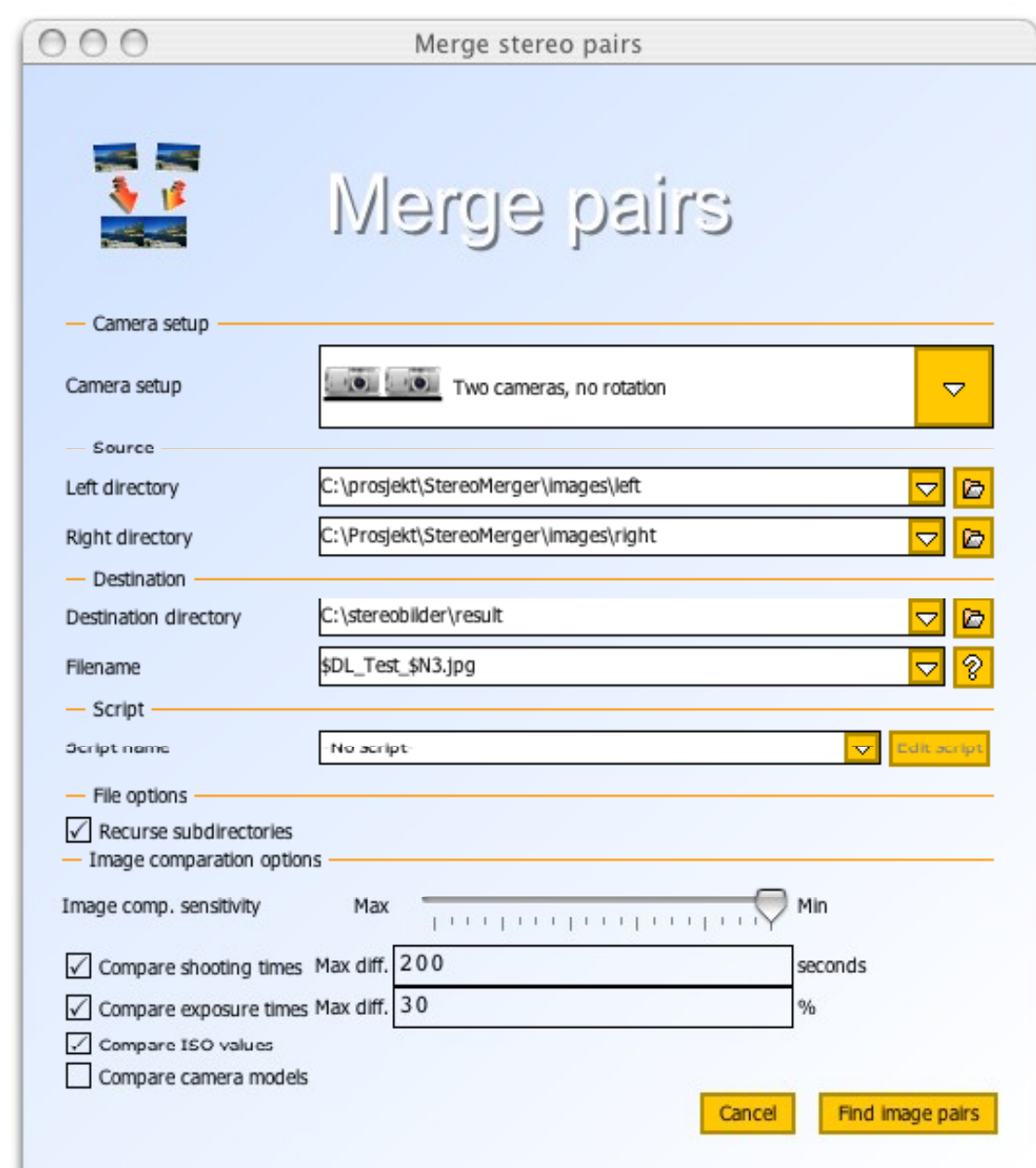
Note: This function is not necessary for images taken with beamsplitters.

Note 2: To manually create stereo-images, use the viewer/editor.

6.1 Settings

StereoMerger can automatically find matching stereo images, apply scripts to the new images and create automatic file names. But before it can do that, you must provide StereoMerger with the correct settings.

That is a simple task, and most of the time you use the same settings, so there's not really that much to do.

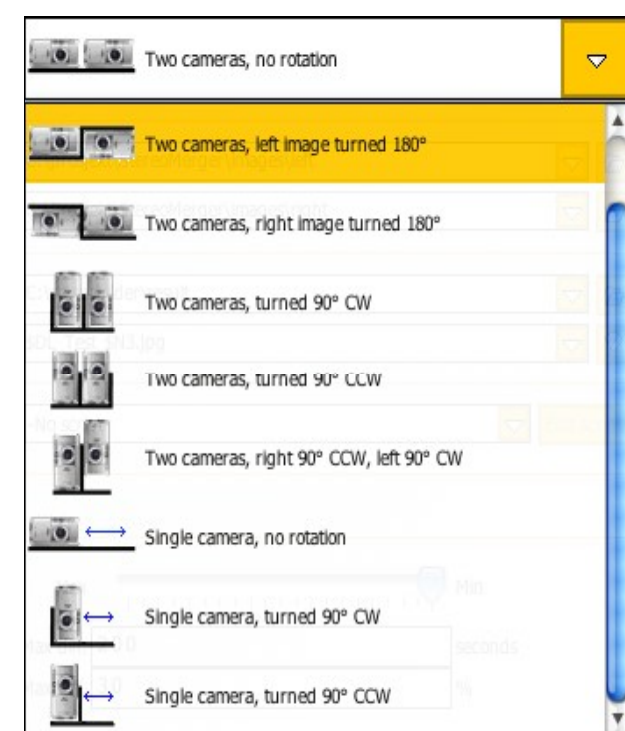


6.1.1 Camera set up

The first thing you have to do is find the camera setup you used when taking the images. This is important for two things:

1. The final images will be rotated correctly
2. The image matching mechanism do a better job.

As you can see by the illustration to the right, StereoMerger supports most combinations.



6.1.2 Source directories

Here you must choose the directories on the computer where you have the left and right images. For single camera setups, there only one directory.

6.1.3 Destination directory

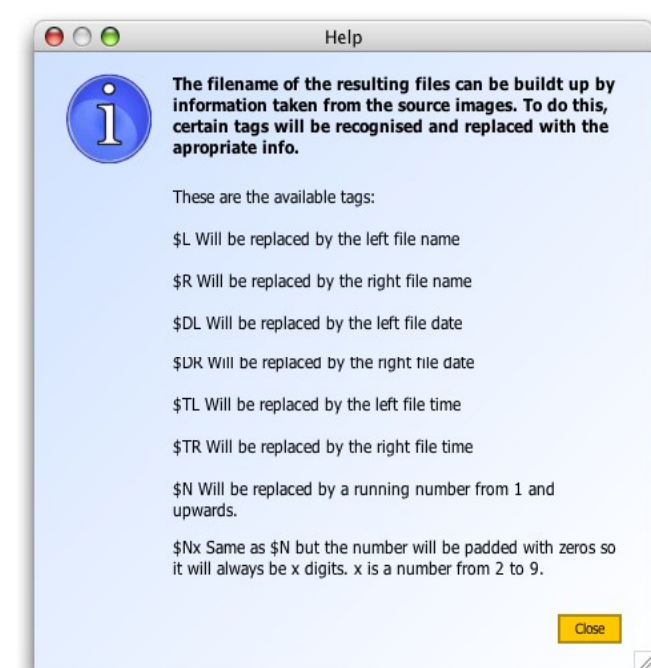
This part tells StereoMerger where to put the final stereo-images and how to name them. The names of the new files can be built up using different codes. These codes will be replaced with information fetched from the source when the files are to be saved.

File name examples:

Lets say we have two matching images from two cameras. The camera's clocks are a little bit out of sync. The images are of my wife's birthday.

Left image: IMG_0540.jpg Time of capture: 2006 04 04 18:40:02
 Right image: IMG_0531.jpg Time of capture: 2006 04 04 18:40:23

Example	Resulting name
\$L.jpg	IMG_0540.jpg
\$DR_Agnes.jpg	20060404_Agnes.jpg
\$N3_Birthday_\$TL.jpg	001_Birthday_184002.jpg
\$DR_Agnes_birthday_\$N4.jpg	20060404_Agnes_birthday_0001.jpg



6.1.4 Script

Under the script section, you find the script-selector.



Here you can choose, create or edit the script that will be applied to the final stereo-images. This can easily be changed later in the process, so do not worry too much about this. Scripts are covered in a later chapter.

6.1.5 File options

The only file option is the possibility to recurse subdirectories.

6.1.6 Image comparison options

Image comparison sensitivity

This should mostly be left at minimum, which is the fastest setting, and rarely needs to be changed.

Compare shooting times

If the time difference between two images exceeds this number, they will not be compared. This speeds up the process a lot. If you have a dual camera rig, make sure the two cameras' clocks are synced so you can set the *compare shooting times* as low as possible.

Compare exposure times

If the exposure difference between two images are higher, in percent, than this number, they will not be compared. Different exposure times are very common when using auto-settings on cameras, but when the difference is too big, it can indicate that the images are not a match.

Compare camera model

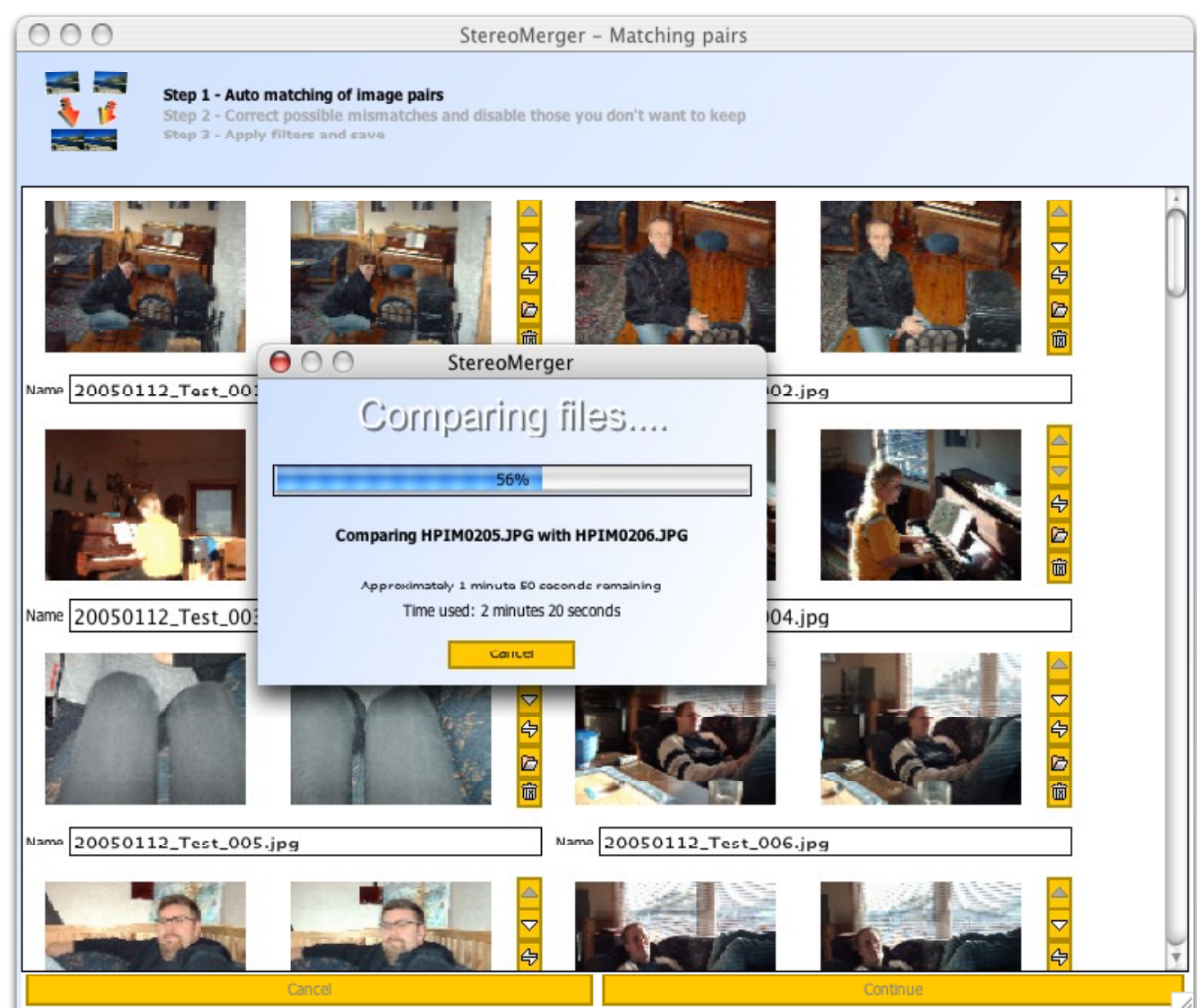
This one is self explanatory. Could be useful in some cases.

6.2 Image comparing

When the settings are as you wanted, and you pressed the *Find image pairs*-button, you will get this window:

As soon as the process starts, you will see the probable matches appear in this window. You can start checking the images for obvious errors immediately, but on slower machines, you better let the process finish before you do anything.

Even though StereoMerger's matching algorithm is good, it's mainly built for speed. It's not particularly intelligent and it can and will be wrong sometimes!



6.2.1 Correct errors

To correct errors, you can use the column with buttons to the right of the pairs.



The up- and down-arrows let you flip through the probable matches that StereoMerger found.

This swap-button swaps the left and right images.

The folder opens up an image browser so you can search for a better match in case StereoMerger failed to find the correct one.

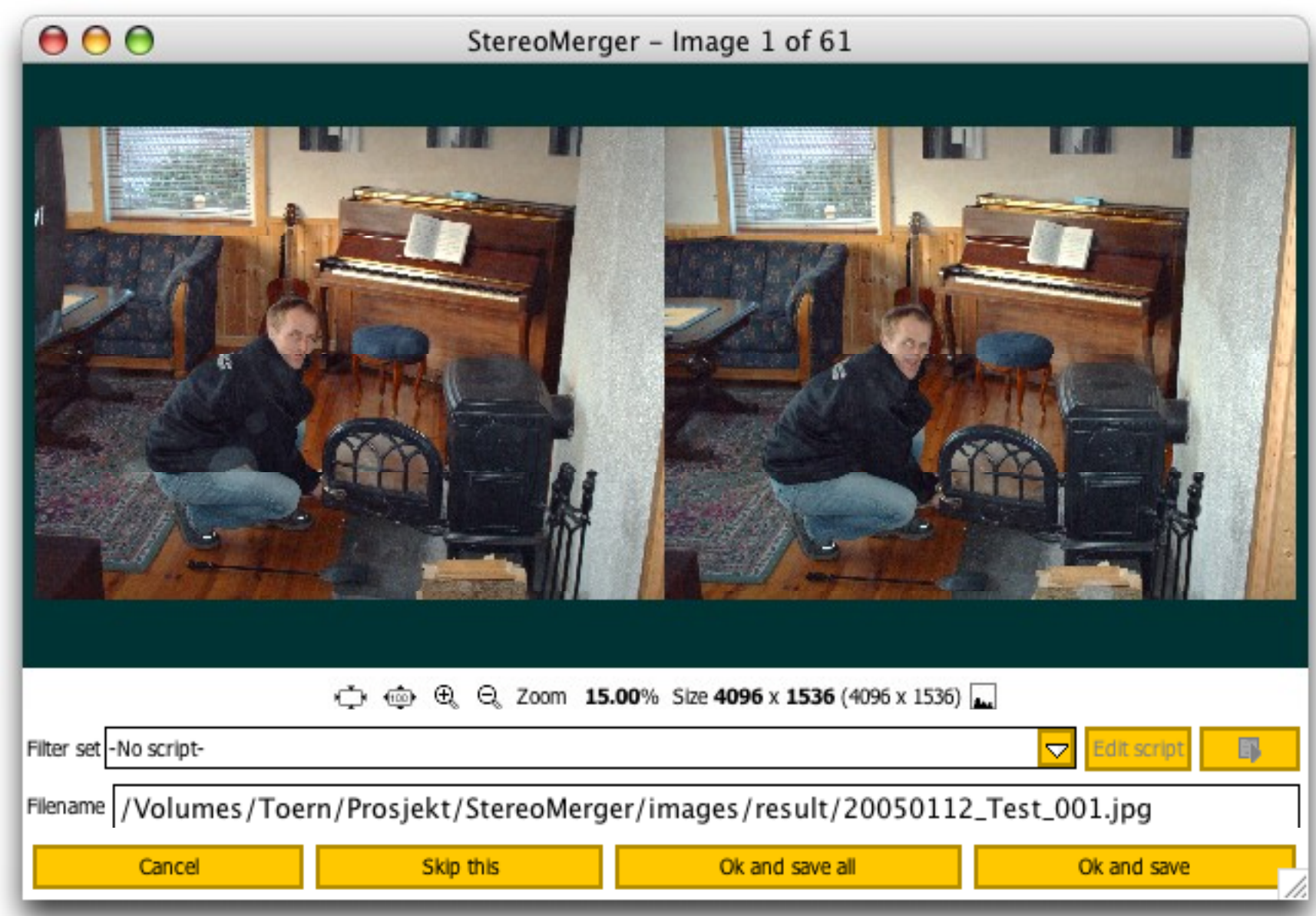
The trash-can button deletes the image pair. Often there can be misfires, some single images or something that have no match. The same can be done by double clicking the image. No source images will be deleted. Undelete by pressing it again.

6.3 Preview

After the match process, you will come to the preview window. This is the final step in the match and merge process.

Here you will see the first two pairs put together as a stereo-image. If you selected a script in the setting-dialogue, the script will already be applied.

If you somehow are not happy with the result, you can change, edit, test and create scripts until you are.



Bells and whistles

Directly beneath the image, you find four zoom-buttons (*Fit to screen*, *Full size*, *Zoom in*, *Zoom out*), size information and a *histogram*-button. These are for view purposes only and have no influence on the final image.

Below that you have the *script selector*, *edit script*-button and *apply script*-button. Under those you find a editable *filename* field that shows where the result file will be stored.

Finally, you have these four buttons:

- | | |
|------------------------|--|
| <i>Ok and save</i> | Saves the current image, loads the next one and applies the selected script. |
| <i>Ok and save all</i> | Applies the selected script on all the remaining images before saving them. |
| <i>Skip this will</i> | Skips the current image, load next image and applies the selected script. |
| <i>Cancel</i> | Ends the whole process. |

NB! Note that there is no way to go back to redo skipped or already processed images at this point. This will probably change in a future release.

7 Batch processing

Sometimes one might want to do the same thing to several images. It could be that one want to resize images for web, maybe add a copyright-message or perhaps make anaglyphs. StereoMerger has a batch processor that will help you do these sort of things.

To start the batch process, click the batch process button()in the main menu.

7.1 *Settings*

Before you start the batch-job, you must tell StereoMerger which images to process, how to process them and where to put the result.

To the left, you have a file browser. This is where you locate the images to process.

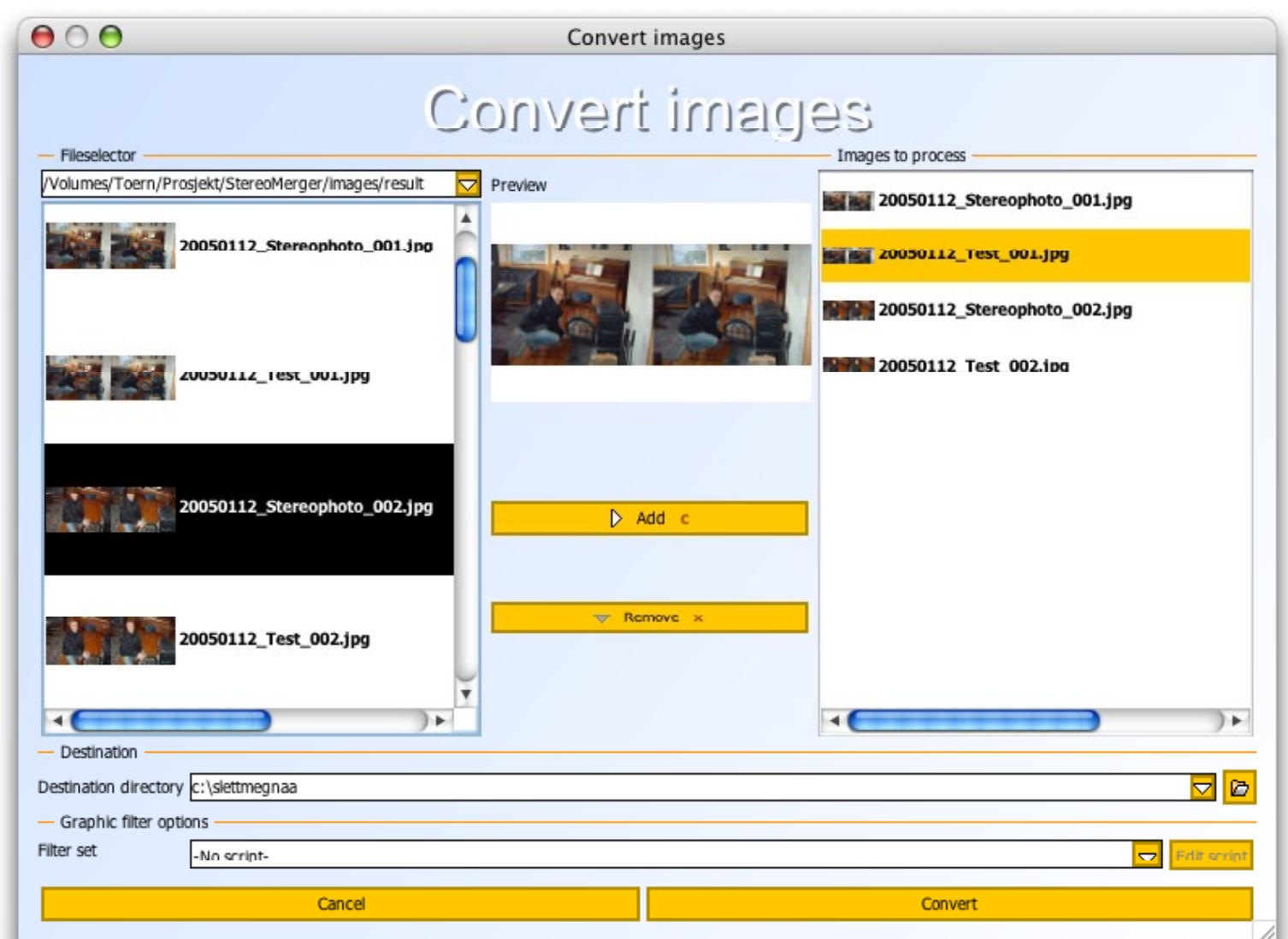
And to the right you see the list where the images to process are listed.

In both lists, you can select multiple images, by using standard key combinations, like *shift+left mouse button*, *Ctrl+left mouse button* or *shift+arrow up/down* on Windows. On OSX you use similar key combinations.

When you have selected images to process, you can add them to the list by pressing the Add-button or by hitting 'c' on the keyboard. You can also add whole directories. StereoMerger then traverse through all subdirectories beneath that directory to find images.

You can remove images from that list if you want to, by selecting them and press the remove-button or hitting 'x' on the keyboard.

The destination directory is where the resulting images will be stored. The resulting files will be stored in a flat structure in the selected path, and the filenames will be kept untouched per default.




Finally, you can select which script to apply to the images. Scripts are covered in it's own chapter.

When you have chosed all the files, destination and script, you can hit the «*Start-process*»-button.

You will now get to the same preview-window as in the last step of the merge-process.

8 Viewer / Editor

The viewer can be opened up by pressing the Viewer-button () on the main menu. You can also drag jpg- and jps-images over the main menu to open up the viewer.

The viewer can display stereoimages in most of the known formats, and you can make your own views by using scripts.

Scripts can easily be applied, and the result can be saved. This is the editor-part.

The viewer also have a nice dual file browser which we will cover a little bit later.



The viewer-window consists of three parts from top to bottom:

1. The view
2. Controls
3. File browser

8.1 *The view*

The view covers most of the windows and have mainly two display-modes. Single- and dual-mode. Changing this mode is done automatically and depends on which type of stereo format you are using. The background colour can easily be changed.

8.1.1 **Single mode**

In single mode, the image is centered when smaller than the visible part of the window. If the image is bigger, then you will see scrollbars. To see other parts of the image, you can either use the scrollbars or use the mouse to drag the image around. Anaglyphs are typically shown in this mode.

8.1.2 Dual mode

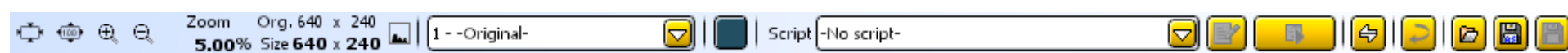
In dual mode, the view is split in two. Left and right image are centered on each sides, so when the image is smaller than the visible part of the window, they are separated as shown below.



Cross-view and parallell-view are shown in this mode. If the image is bigger than the visible part of the window, you will see scrollbars. To see other parts of the image, you can either use the scrollbars or use the mouse to drag the image around.

8.2 Controls

The controls consists of six main parts:

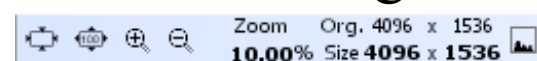


From left you have the zoom controls, view-format, background colour, script-controls, side-swap-button, redo-button and file-controls.

8.2.1 Zoom controls

The zoom controls are used to basicly zoom in and out on the image. They hav no effect on the result, and are just for viewing purposes.

From left to right we have:

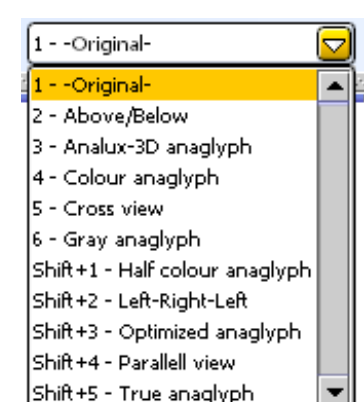


- Fit to window - button
- Full size (100%) - button
- Zoom in - button
- Zoom out - button
- Zoom ratio
- Orginal and new size
- Show / hide histogram - button

8.2.2 View-format

By default, StereoMerger supports most known viewing formats. Other formats can easily be supported by using scripts as the selected script will be applied to the images you load. This will, of course, not change the original image.

When it comes to anaglyphs, only red and blue anaglyphs are supported. This is because it is superior to other colour combinations in terms of ghosting and colour



leakage. However, if you really want any other anaglyph formats, contact me and I'll see what I can do!

To enable the wanted viewing-format, keyboard shortcuts can be used. By pressing 5, you'll get *cross view* and *shift+3* gives *Optimized anaglyph*. This list is sorted alphabetically, so it will differ in different languages.

Most formats should be self-explanatory, but here's a quick description anyway:

-Original-

Shows the image as it is.

Above/Below

Shows one image above the other

Analux-3D

This is a loose implementation of the Analux-3D method by Dr. Imre Zsolnai-Nagy and Bernardo Galmarini. (<http://www.freeweb.hu/conversion3d/ANALUX/analux.htm>). It gives less ghosting-problems than pure colour anaglyph while trying to keep as much as possible of the colour-information.

Colour anaglyph

Shows image as a full colour anaglyph. Have great colours, but heavy ghosting can easily occur. Especially with images that contains a lot of red.

Cross view

Cross view shows left image on the right side and vice versa. This is the preferred free viewing method for most people. It requires no means to view.

For more info, see for instance: http://www.stereo3dgallery.net/abouts/3dc5_ParCross.shtm

Gray anaglyph

This is probably the mostly used anaglyph. It results in a grayish image with very little ghosting. Most colour information is lost.

The image is mainly gray since the blue channel is copied into the green channel. Since parts of the green spectrum is visible through the red lens, some ghosting will appear.

Half-colour anaglyph

The half-colour anaglyph is a compromise between gray and colour anaglyph. Keeps some colour information while trying to minimize ghosting.

Left-Right-Left

This view displays the left image on both sides of the right. This way you can use both parallel viewing and cross viewing.

Optimized anaglyph

Optimized anaglyph is somewhat similar to Analux-3D, and gives in most cases the same good result. Which is better? You decide.

Parallel view

Parallel view is the second most popular free viewing method. There are many viewing aids available for parallel viewing, so it is very popular on both screen and paper. This is the format used by Holmes Card viewers, Loreo and others. In fact, the standard stereo-format uses this format, and it is also the natural format for cameras with beamsplitters.


True anaglyph

This is the mother of all anaglyph types. The two images are turned into a pure red and pure blue image, and then merged together into one very purple image. Viewed with red and blue anaglyph-glasses, this gives a near ghost free result.

8.2.3 Background colour

The little coloured button between the view-format dropdown list, and the script selector, let you choose the background colour. When pressed it opens up a colour chooser. Just select the colour you want, and presto, you have a new background colour.

8.2.4 Script controls

The script controls () contains a dropdown list with the available scripts, an edit button and an apply-button.

When you choose a script, you can choose to either edit it, or apply it to the current image. When you apply a script, the result is not automatically saved. How to create and edit scripts are covered in a different chapter.

Please note that the selected script will be applied to all images you load. To turn off this, you must choose -No script- from the list.

8.2.5 Redo button

The redo button () will reload the original left and right images so that you can redo, or undo the scripts you have applied to it.

Note that the button is only available as long as the original images lies in the same path as they did when you merged the stereoimage.

8.2.6 File controls

Finally we have the file controls. These are the *browser*-button, *save as*-button and *save*-button.

The *save*-button saves the current image over the previous version. So if you have applied a script to this image, the result will overwrite the original.

The *save as*-button lets you choose a new name for the image you are saving.

The *browser*-button opens or closes the file browser. See next paragraph.

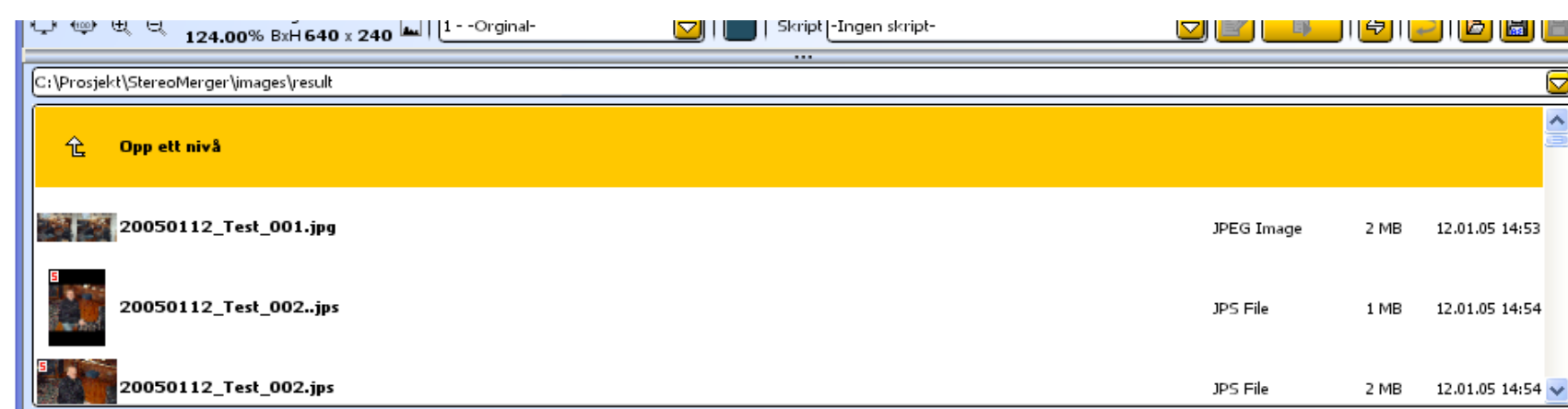
8.3 File browser

The file browser is a powerful tool. It can be opened up in three ways, either by pressing the *browser*-button, hit 'b' on the keyboard or by *dragging the divider-line*. The divider-line is the thin line with three dots on it:



The divider-line can be dragged up and down to give more or less space to the file browser.

When open, you see a drop-down list showing the current directory on top, and below that you see a list with the images in this directory.

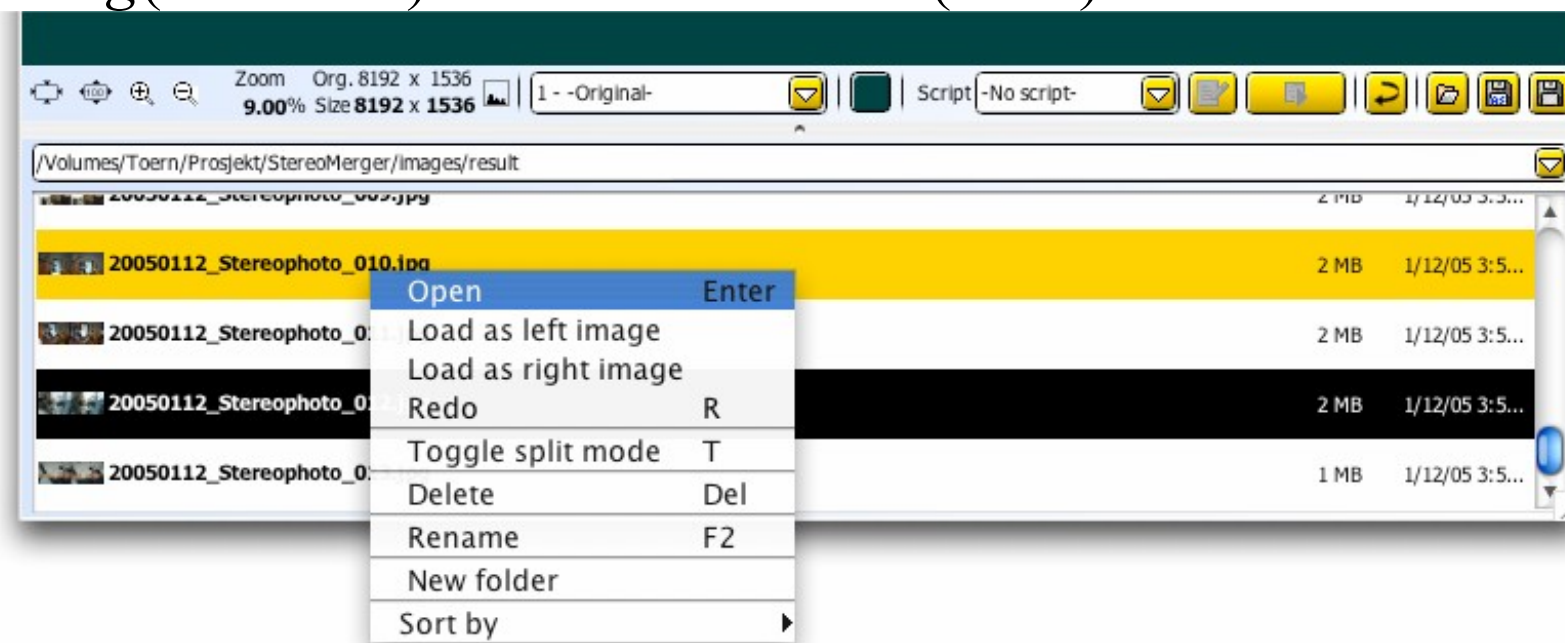


Images are displayed with small thumbnails, name, type, size and date. A little red 'S' in the upper left corner of the thumbnail, indicates that the image is a stereo-image.

The drop-down is editable with full cut and paste support, and it contains a history of the previous used directories for easy retrieval.

To navigate in the browser, you can either use the *mouse* or the regular *arrow-keys*. *Space/backspace* let's you view the next/previous image in the directory. The browser do not need to be open to use space/backspace.

More options are available through a context menu. This menu can be opened up by *right-clicking*(Windows) or *ctrl+mouseclick*(OSX) on a file in the browser.



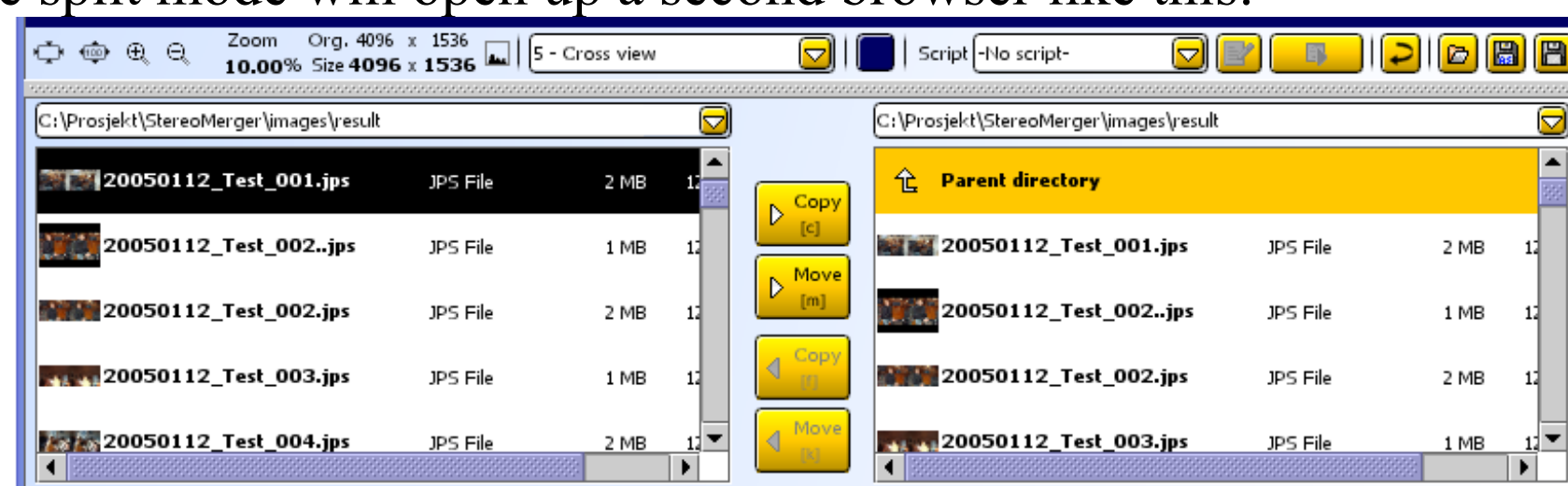
As you can see, you can use this to create a new stereoimage by loading left and right image via the context menu.

Redo is the same as the redo-button previously covered.

Most of the other options should be easy to understand, except the «*Toggle split mode*».

8.3.1 Split mode

Toggle split mode will open up a second browser like this:



These dual browsers can point to different directories. You can then easily copy and move files back and forth between them.

Lets say you want to print a collection of the best stereoimages you have. You can the let the right browser point to [c:\](#), create a new folder called toPrint and then direct the right browser to the newly created folder [c:\toPrint](#).

You can now quickly go through several directories on the left side browser, view the images you might think is good enough and copy only the best ones to the right side browser. With the keyboard shortcuts, you can even close the browsers, and use the whole screen to view the images. By pressing *space* and *backspace*, you can flip through the image available in the current directory. Then, when you find a really good stereoimage, fit for print, hit the 'c'-key to copy it to the new folder.

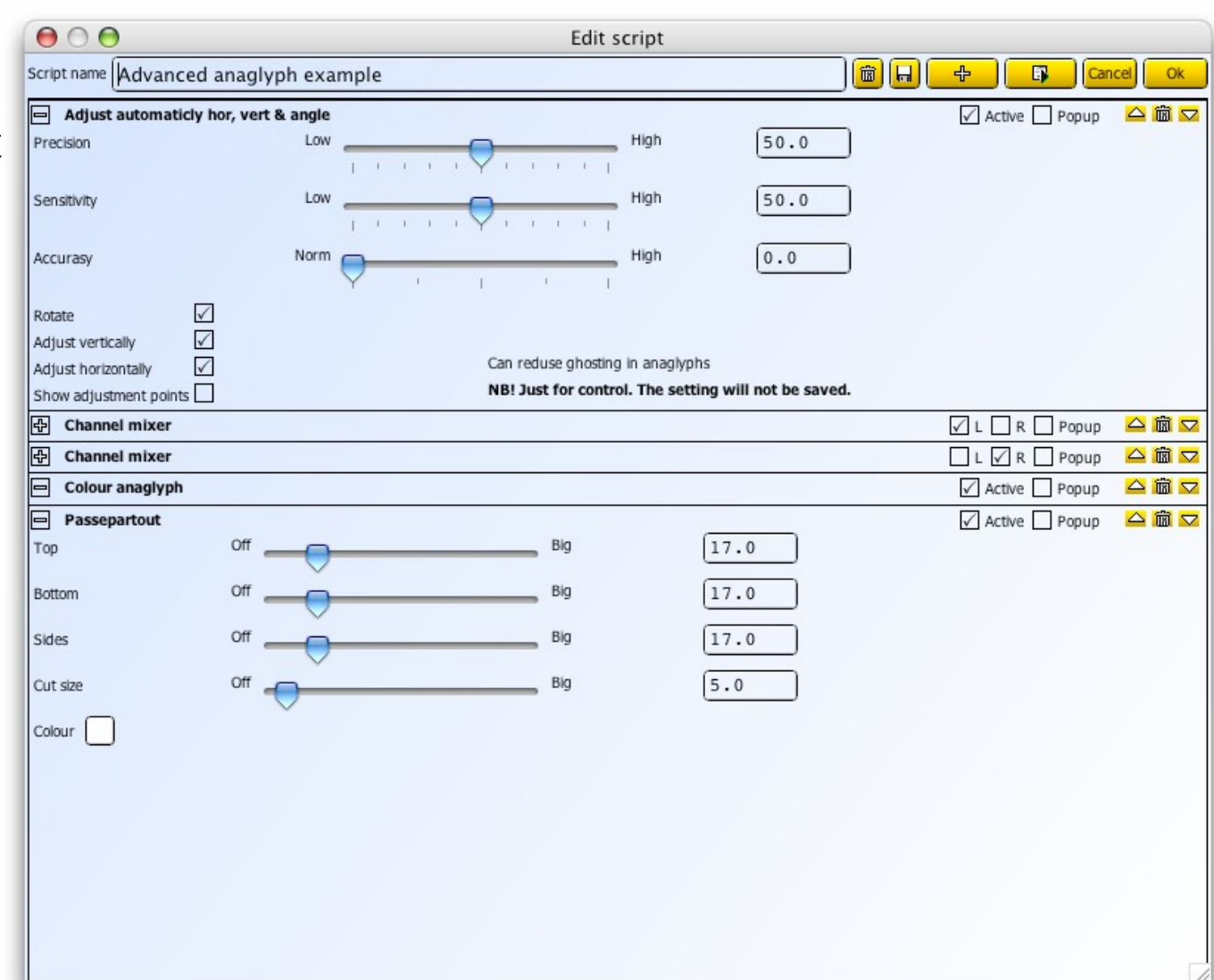
9 Scripts

Scripts is the most complex part of StereoMerger, but still it shouldn't be too hard to understand. To open up the the script editor, select a script from the script-selector and press the edit script-button (🔧).

The script editor contains a controller-line at the top, and the rest of the window is used to display the filters that makes up the script.

At the top you'll find:

- The script-name
- Delete script-button
- Export script-button
- Add filter-button
- Apply script-button
- Cancel-button
- Ok-button



9.1 Controller-line

9.1.1 The script name

The script name can be changed anytime. It is advisable to use a descriptive name so that it is easy to find it later.


9.1.2 Delete script-button

The *delete script*-button (🗑️) will delete this script permanently. A confirmation box will appear.


9.1.3 Export script-button

The *export script*-button (💾) will let you save this script to a file. This can be used simply as a backup, or it could be e-mailed to your friends or maybe even published on the internet. So, if you have made a killer script, you can now share it with everybody!

9.1.4 Add filter-button

The *add filter*-button () will open up a little menu with five filter categories. Filters are applied top to bottom, and when you add a new filter, it will be added at the bottom.

9.1.5 Apply script-button

The *apply script*-button () simply applies the script to the image. Note that the script is applied to the image as it was when you loaded it. This means that if you have made a script that shrinks the image by half, and you applies it twice, the result is still just a ½ sized image, and not a ¼.

It is also worth mentioning that filters are applied top to bottom, and when you add a new filter, it will be added at the bottom.

9.1.6 Cancel-button

This will cancel the changes and close the script editor.

9.1.7 Ok-button

Pressing the ok-button will save the changes, close the editor and apply the script.

9.2 Filter-categories

In StereoMerger there are five basic filter categories. Here comes a short description:

9.2.1 Image-category

The image-category contains some 14 filters that do image transformations like scale, crop, adjust, rotate, flip and more. One of these filters can automatically adjust the two images so that they are rotated and correctly aligned to each other.

9.2.2 Colour-category

The colour-category contains 7 filters that can be used to control the colour, brightness and more. One of the filters can automatically adjust the colours for you.

9.2.3 Effects-category

The effects-category contains 9 filters that can remove noise, smooth, soften, sharpen and more. There's even a matrix filter so you can create your own filters.

9.2.4 Anaglyph-category

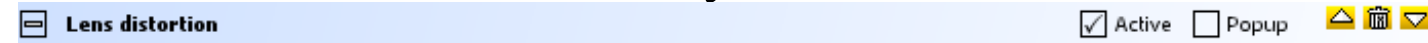
The anaglyph-category contains six anaglyph filters. The most usefull here is by far the colour anaglyph. Together with the *Channel-mixer* found in the *colour-category*, you can make any type of anaglyph!

9.2.5 Special-category

The special-category contains 12 filters that do not fit in any of the other categories. Here you will find filters that can draw text, borders, reference dots, fix lens distortion and more.

9.3 Basic filter functionality

All filters have some basic functionality. Each filter has controllers for this at the top.



Below this line, the filter's own settings are displayed, unless the filter is collapsed of course, or it simply does not have any controls.

At the top, from left to right we have:

9.3.1 Open-, collapse-button

Opens or collapses the filter. Since some filters are quite verbose, collapsing them will give a better overview of the script.

Note that some filters have no info or controls, so opening them will reveal nothing.

9.3.2 Filter name

Simply the name of the filter

9.3.3 Activation checkboxes

In StereoMerger, there are two different types of filters:

- Those who always must be applied to the whole image ☒ Active
- Those who can be applied to a single side ☒ L ☒ R

The first one enables/disables the execution of this filter in this script. The latter type lets you disable/enable the execution of this filter for each of the two sides.

9.3.4 Popup

This is an important feature. Enabling this will, if the script is executed from outside the script-editor, open up a dialogue (popup) displaying the settings for the filter. The dialogue has a preview button, so all changes you do, can be previewed before you continue the rest of the script execution. Popups are nice to use for filters with text or some sort of manual adjustments.

9.3.5 Order and delete buttons

The last three buttons let you rearrange the order of execution by moving this script up or down in the list, or by simply deleting it.

9.4 **Create new script**

To create a new script, you simply choose *-Add new script-* in the *script-selector* and then the *edit script*-button. Give the script a new name, and the next time you press the *ok*-button, it will be saved.

9.5 **Import Script**

To create a import a script, you simply choose *-Import-* in the *script-selector* and then a file selector will be displayed. Simply choose the script to import and press the *Import script*-button. If there are a script with the same name, the imported script will get a number appended.

9.6 **Duplicate script**

To duplicate a script you can simply export it, and import it.

