Cosima – First steps

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Cosima (*CO*rrect *S*tereo *IM*ages *A*utomatically) is an alternative or complementary program to StereoPhoto Maker and runs on Windows PCs (WinXP to Win10).

Cosima has been around since 2004, the author Gerhard "Peter" Herbig from Germany is the well-respected Technical Advisor to the German Society for Stereoscopy (DGS).

You might not have heard of it but it is very popular in the German speaking countries of Germany, Switzerland and Austria, where we regularly run workshops for our members.
It was recently presented at the 2017 ISU Congress in Irvine by Peter himself.

Here I would like to explain how easy Cosima really is to use.

Cosima can be used not only to adjust stereo images, but to adjust video files too.
In this article we will concentrate on stereo images, version 09h9 is the latest release available.

The standard mode is equivalent to the Multi Conversion tool in StereoPhoto Maker, it will adjust all the images in a folder in one run.

Before installing Cosima, I recommend you install Irfanview (32 or 64 bit version). I recommend you right-click on the setup.exe and "Run as administrator" (if available) or double-click on exe will do.
Irfanview is used by Cosima to sharpen images during adjustment. Not a must, but it is useful.
Irfanview will be recognised during the Cosima installation and will be automatically integrated into Cosima
http://www.irfanview.com/

First thing to do is to download Cosima.
http://www.cosima-3d.de/releases/setup_cosima_gui_09h9.exe

Next thing to do is to install Cosima
- Right click on setup_cosima_gui_09h9.exe and "Run as administrator" (if available) **or double-click on exe**

Warning: Since Cosima is unique to us stereoscopists, it is sometimes not recognised by Windows and virusscanners.
Windows 10 for example might well display a pop-up window "Windows protected your PC"
"Windows Defender Smartscreen prevented an unrecognized app from starting.
Running this app might put your PC at risk."
It just shows "Don't run" button

Need to click "More Info" to reveal "Run anyway" button.

Then normal User Account Control -> Do you want to allow this app from an unknown publisher to make changes to your device?
Click "Yes"

- Select language "English" and click on "OK", then "Next"
- Accept the agreement and click on "Next"
- "Next" to continue with Setup
- Click on "Next" to accept the default path C:\Cosima
- Click on "Next" to accept the default name Cosima for the shortcut
- click on "Next" to add all 4 additional icons (the use of these is not covered by this article)
- Now we are ready to click on "Install" and install the software Cosima
- Once installation is complete, a Notepad window will appear explaining how to start using Cosima.
- Close this when you have read it and then click on "Finish" to close the installation process

The above is the version for stereo images, if you also want to try video adjustment, then the

link below will install all the codecs and tools you will need.
http://www.cosima-3d.de/releases/setup_cosima_complete_09h9.exe
Warning: Unless you are an advanced Windows user, I highly recommend you only install "setup_cosima_gui_09h9.exe" (just for images). Installation and use of Cosima Complete is quite complex and is not covered by this article.

I strongly recommend you install Cosima to the default location C:\Cosima
Cosima stores temporary files in the installation folder during operations. This is not allowed if you are working with restricted rights.

<u>Licence:</u>
To unlock the full potential of Cosima, you will need to license Cosima.
http://cosima-3d.de/ordering.html

My recommendation is to try out Cosima and make sure it is for you before licensing.
A lifetime licence costs 99 Euros, but it is worth it. Registering with Peter provides you with prompt support should you have a problem or question.
After installation you will need to note your Windows user name (which is shown in the Cosima help menu under "Licensing Cosima" and to which your licence will be linked). On the first run a request will appear in pop-up command window asking whether you have got a licence.
Without a licence, Cosima will function normally but images of more than 800 x 800 pixels will be watermarked with "mounted with cosima" stamped into the image.
Peter will supply 1 licence each for two separate user names for the price of one, so the licence can be used on multiple machines assuming you use the same user names.
If you have already licensed Cosima on this machine sometime in the past, then this might not be required again.

Now that Cosima is installed, let's have a look at the file structure.

I will assume that you probably take images using one of three methods:
1) A stereo camera such as the Fujifilm W1/W3 or Panasonic Lumix 3D1. Stereo images are saved as .mpo files.
2) A twin-camera rig taking separate images, the left camera is upside down, the right camera right way up. Images are usually .jpg or .tif, but can also be in raw format.
3) A twin camera rig or single camera taking left and right images, both the right way up. Images are usually .jpg or .tif, but can also be in raw format.

The easiest rule to follow is to copy your side-by-side images (.mpo or .jpg) to a sub folder called "S", left and right images to folders called "L" and "R"
The files don't need to be renamed, but left and right images should match for our first try. Windows sorts images alphanumerically, so images should be in the same order they were in the camera.

So let us try creating two test folders and taking our first steps

Create a new folder called "Images" on our PC
In the folder Images, create two new folders called "W3" and "Twincam"
In folder W3, create a new folder called "S" and copy three .mpo images (or side-by-side .jpg images) to folder S
In folder Twincam, create two new folders called "L" and "R" and copy three left images to folder L and three right images to folder R. These need to be three matching pairs, the left image can be either upside down or right way up.

These images we will use as test images for our first steps, see the documentation which follows for Fujifilm W1/W3 or stereo-camera Side-By-Side images and the Twin-camera rig document for using the images stored in folders L & R.

It is normal practice to use a new folder for each project, just adding images to an existing folder will cause all images (old and new) to be adjusted. A tip is to use calendar date for your folder name and Cosima will process all images from that camera in "portions" of a calendar day (example 2017-11-16) In this folder create subfolders S or L and R and copy your images to here

Fujifilm W1/W3 or stereocamera creating side-by-side images (.mpo or .jpg):

Start Cosima, click on the icon "Cosima Gui" (should be on your desktop or in the menu)
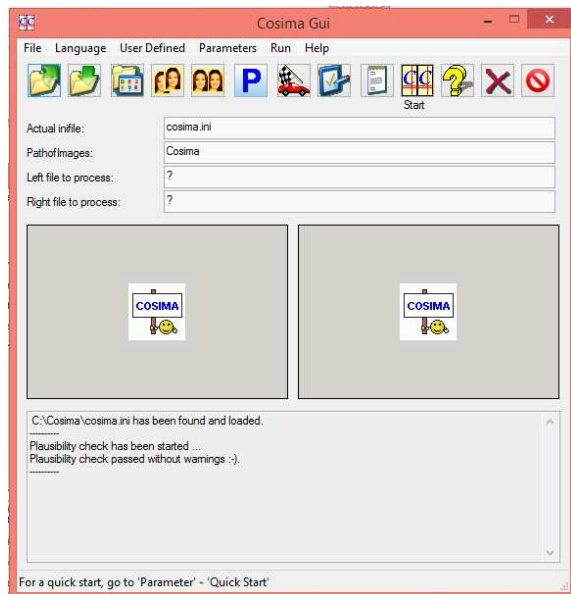
First we need to set the parameters for our W3 .mpo images, we will create some .jpg images
compressed to 80% and scaled to 1920x1080 (or 1400x1050 for 4:3 ratio) resolution for
projection.

Click on the big blue P button just below Parameters menu, the Parameter Tabs will open.
Here we see several tabs along the top row for input, output, correction, video, anaglyph and
external. All the values are set at their default value - nearly all of them have a green
background. Click on OK to close the parameters menu.
This exercise was just to show you where all parameters can be set and viewed.

Click on "User Defined" in the menu, a long list of predefined parameters will appear.
Hovering over one of these will display which parameters will be changed, let's try this with
option 5 (Input – stereo images, from s-subfolder) Click on "Click here!"

Using the same method, select the following parameters:
9. Output – for projector (1920x1080)
24. Create jpg 80% quality

After doing this, open the parameters tab and let us check what has changed (highlighted in orange)
General tab: HtmlImages is now on option 2 (the report file will display thumbnail images
SBS)
Input 1 tab: InputMode is set to option 9 (in our case Cosima will search for SBS images in
folder s)
Input 1 tab: StereoImageInput is option 1 (One-file input (side-by-side, MPO, ...))
Output 1 tab: LeftRightOutput is disabled (0 = no separate images)
Output 1 tab: AnaglyphOutput is disabled (0 = no anaglyph images)
Output 1 tab: OutputFormat is set to option 1 (Images will be written using the jpg format)
Output 1 tab: jpg_quality is 80%
Output 2 tab: OutputWidth/OutputHeight is 1920 x 1080 pixels
Click on "OK" to close parameters tab

*Most parameter entries that are no longer the default have been highlighted in orange and should be
easy to spot. As every inifiles has its own settings, each will be different and is unique to that inifile.*

*Clicking on the reset button next to the entry will change the setting to the default, to reset all
parameters to the default go to the menu "Parameters" and click on "Reset all for images"*

*If using 4:3 images or any format other than 16:9, then go to the Parameters Tab and
manually set "Output 2 tab" resolution to 1400 x 1050, 1600 x 1200 or any other desired
output size which matches 4:3 or your input format. Leaving the output on 1920 x 1080 will
cut off the bottom and top of your images. For unscaled images (to archive) set both width
and height to un-scaled.*

The next thing to do is save the configuration, create a new .ini file

Menu "File", "Save settings (save inifile) …"

So that we know what the file will do, give it a meaningful name such as "FujiW3_jpg80proz_1920x1080.ini" or "FujiW3_jpg80proz_1400x1050.ini"

We will save this file to a place, where we will store all our Cosima project files (inifiles) or directly into our new created W3-directory.

You can create as many ini files as you like, each for its own special purpose. The files should be so named that you know what it will do. You just need to load the correct ini file for your purpose in the future. After changing any parameters in the ini file, I recommend you save it with a new name.

Now that this is saved it will appear in the Cosima gui (graphic user interface) as "Actual inifile"

As you will be able to see, the "PathofImages" is not yet set, that is our last step.

Menu "File, Select 'PathofImages' …"

Select the top folder called "W3" (Cosima will find the folder "S" that is within it automatically)

Now that we have set the path of images and loaded the correct inifile, we're ready to go.

Click on the start button in the Cosima gui

A pop-up command window will appear; here the details of the run will appear.

If you haven't already licensed Cosima, then you will be required to enter this now.

If not licensed, a watermark will be stamped into images larger than 800 x 800 pixels.

When the run has completed, we can find our adjusted images in in the W3 folder in a subfolder call "CS" (stands for correct stereo).

By default, the filename looks like this "DSCF1294_026_cs.jpg"

The figure 026 shows the deviation (far point disparity minus near point disparity) of the images in promille (thousandths).

Ideally an adjusted image should show 012 to 033 to be optimal for projection on a big screen. 033 is equivalent to 1/30 of the width of the image.

_cs shows that the image has been adjusted by Cosima.

In the "W3" folder 3 files should now be present.

a) "cosima_report.txt" shows all the details which appeared during the run within the command window in text form.

b) "cosima_report.html" shows the same details in a html layout (for your internet browser) together with the side-by-side image we requested in the parameters menu with the option "General tab: HtmlImages is now on option 2 (the report file will display thumbnail images SBS)". The html report file can be opened directly from the Gui menu 'File' – 'Show last report file', or by double-click.

c) "cosima_files.txt" holds the correction information which can be used to reuse the Cosima values already used in the first run. (This is outside the scope of this article)

Now, you might be asking yourself what I meant with "**Here I would like to explain how easy Cosima really is to use**".

Well, the difficult part was creating folders, copying images and creating our first inifile

Assuming we will probably want to do exactly the same thing to our images as we have just done, we just need to do four things the next time we want to use Cosima:-

1) Copy our images to folders S or L and R

2) Start Cosima Gui and select our inifile **(I always check that the parameters are correct for my purpose – open parameter tabs – settings which are not the default are in orange and easy to spot)**

3) Select the "Path of images"

4) Press "Start" in Cosima

Twin-camera rig taking separate images. Images are usually .jpg or .tif, but can also be in raw format.

Start Cosima, click on the icon "Cosima Gui" (should be on your desktop or in the menu)
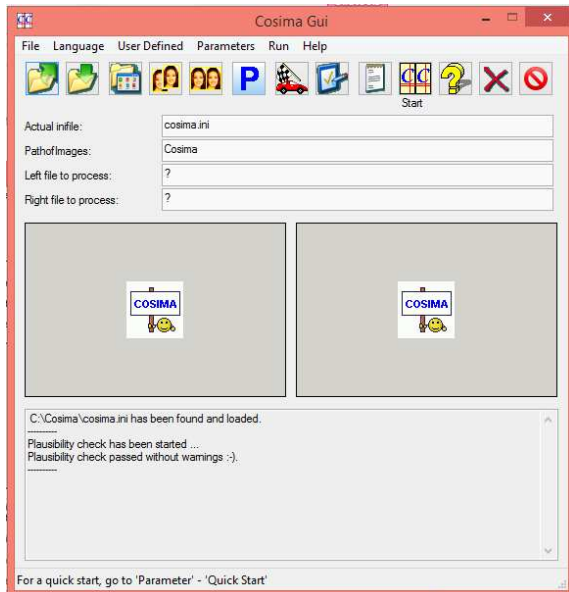
First we need to set the parameters for our twin-camera-rig (left camera is upside down) .jpg 16:9 pixel images, we will create some .jpg images, not compressed (100%) and scaled to 1920x1080 (or 1400x1050 for 4:3 ratio) resolution for projection – plus .mpo for 3DTV.

Click on the big blue P button just below Parameters menu, the Parameter Tabs will open.
Here we see several tabs along the top row for input, output, correction, video, anaglyph and external. All the values are set at their default value – most of them have a green background. Click on OK to close the parameters menu.
This exercise was just to show you where all parameters can be set and viewed.

Click on "User Defined" in the menu, a long list of predefined parameters will appear.
Hovering over one of these will display which parameters will be changed, let's try this with **option 3 (Input – z-bar camera from l/r folders) Click on "Click here!"**
Using the same method, select the following parameters:
  09. Output – for projector (1920x1080)
  25. Create jpg 100% quality
  27. Add MPO images

After doing this, open the parameter tabs and let us check what has changed
  General tab: HtmlImages is now on option 2 (the report file will display thumbnail images SBS)
  Input 1 tab: InputMode is set to option 9 (Cosima will search for images in folders l & r)
  Input 1 tab: StereoImageInput is option 2 (Two separate (mono) files for the left and right image)
  Input 2 tab: RotMirInputLeft is option 2 (Rotation by 180 degrees)
  Output 1 tab: LeftRightOutput is disabled (0 = Writes no separate images)
  Output 1 tab: StereoOutput is option 2 (Writes side-by-side image into the subdirectory \cs\)
  Output 1 tab: AnaglyphOutput is disabled (0 = Writes no anaglyph image)
  Output 1 tab: ExtraOutput is set to option 5 (Writes a MPO image)
  Output 1 tab: OutputFormat is set to option 1 (jpg images)
  Output 1 tab: jpg_quality is 100%
  Output 2 tab: OutputWidth/OutputHeight is 1920 x 1080 pixels
Most parameter entries that are no longer the default have been highlighted in orange and should be easy to spot. As every inifiles has its own settings, each will be different and is unique to that inifile.
Clicking on the reset button next to the entry will change the setting to the default, to reset all parameters to the default go to the menu "Parameters" and click on "Reset all for images"

If using 4:3 images or any format other than 16:9, then go to the Parameters Tab and manually set "Output 2 tab" resolution to 1400 x 1050, 1600 x 1200 or any other desired output size which matches 4:3 or your input format. Leaving the output on 1920 x 1080 will cut off the bottom and top of your images. For unscaled images (to archive) set both width and height to un-scaled.

The next thing to do is save the configuration, create a new .ini file

Menu "File", "Save settings (save inifile) …"

So that we know what the file will do, give it a meaningful name such as "stereocam_jpg-mpo_100proz_1920x1080.ini"or "stereocam_jpg-mpo_100proz_1400x1050.ini"

We will save this file to a place, where we will store all our Cosima project files (inifiles) or directly into our new created Twincam-directory.

You can create as many ini files as you like, each for its own special purpose. The files should be so named that you know what it will do. You just need to load the correct ini file for your purpose in the future. After changing any parameters in the ini file, I recommend you save it with a new name.

Now that this is saved it will appear in the Cosima gui (graphic user interface) as "Actual inifile"

As you will be able to see, the "PathofImages" is not yet set, that is our last step.

Menu "File, Select 'PathofImages' …"

Select the top folder called "Twincam" (Cosima will find the folders "L" and "R" that is within it automatically)

Now that we have set the path of images and loaded the correct inifile, we're ready to go.

Click on the start button in the Cosima gui

A pop-up command window will appear; here the details of the run will appear.

If you haven't already licensed Cosima, then you will be required to enter the licence number now.

If not licensed, a watermark will be stamped into images larger than 800 x 800 pixels.

When the run has completed, we can find our adjusted images in in the Twincam folder in a subfolder call "CS" (stands for correct stereo) and our MPO images in subfolder "

CE_MPO" (stands for correct extra, specifically for mpo)

By default, the filename looks like this "DSCF1294_026_cs.jpg"

The figure 026 shows the deviation (far point disparity minus near point disparity) of the images in promille (thousandths).

Ideally an adjusted image should show 012 to 033 to be optimal for projection on a big screen.

033 is equivalent to 1/30 of the width of the image.

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In the "Twincam" folder 3 files should now be present.

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The html report file can be opened directly from the Gui menu 'File' – 'Show last report file'.

"cosima_files.txt" holds the correction information which can be used to reuse the Cosima values already used in the first run. (This is outside the scope of this article)

Now, you might be asking yourself what I meant with "**Here I would like to explain how easy Cosima really is to use".**

Well, the difficult part was creating folders, copying images and creating our first inifile

Assuming we will probably want to do exactly the same thing to our images as we have just done, we just need to do four things the next time we want to use Cosima:-

1) Copy our images to folders S or L and R

2) Start Cosima Gui and select our inifile (**I always check that the parameters are correct for my purpose – open parameter tabs – settings which are not the default are in orange and easy to spot)**

3) Select the "Path of images"

4) Press "Start" in Cosima

A short explanation of the inifiles which indeed are *project files*: when you have your first inifile saved you can change these to add more functions at any time. Load an inifile and open the parameter tabs –change any parameters and remember to save with a new name. I recommend you save these straight away, before you forget what changes were made. I usually select my path of images before saving the file. You can create as many inifiles as you like and save them either in the folder with the images or somewhere central.
I save mine in C:\Cosima.

Hopefully everything is Okay and Cosima is running.

If you're looking for examples of what to configure, a few sample inifiles can be found here:
http://cosima-3d.de/starters.html

If you have further general questions, please post them to the Cosima User Forum
cosima-3d@yahoogroups.de (English and German language welcome).

Have fun with Cosima.

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