

autopano pro & autopano giga

VERSION 2

User manual

English



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# 1 Installation and registration

## 1.1 Contents

- 1 Installing Autopano
  - ◆ 1.1 Installing Autopano on a Mac
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- 2 Unregistered Version Limitations
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## 1.2 Installing Autopano

Welcome to the Autopano installation tutorial! We will first start by downloading the software from the official website. To do so, follow the link provided below and download the installation package matching your operating system.

<http://www.autopano.net/buy-autopano/download.html>

### 1.2.1 Installing Autopano on a Mac

- The file downloaded is a .dmg file, that opens as a virtual disk on your desktop. Open this virtual disk. You see the Autopano icon and a shortcut to your Applications folder.



- Drag the Autopano icon on the shortcut of your Applications folder.
- Open your Applications folder and look for Autopano Pro or Autopano Giga. Open it directly from the Applications folder.
- You can then create a shortcut on your desktop if you want to (by holding down Alt and Cmd keys and dragging the Autopano icon from your Applications folder to your desktop).

Note : The .dmg file is located in Home/Downloads.

### 1.2.2 Installing Autopano on a PC

- If you have a PC running Windows, open the downloaded file and go through the installation process.
- If you have a PC running Linux, download the .deb or .tar.gz file and proceed to the installation.

## 1.3 Unregistered Version Limitations

The version of the software you can download from the website has some functional limitations in demo mode:

- All rendered images will have a watermark,
- Projects files (.pano) cannot be saved,
- Export to panotools is limited (only the first image pair will be exported with all the control points).

These are the only 3 limitations; the rest of the software is fully functional. Moreover, the trial version is not time limited. You can use the unregistered version for as long as you want to evaluate the program.

## 1.4 Purchasing a License

Thank You! It is a good idea to support our efforts in bringing you the best stitching software available on the market today. To do so, just go to our online store:

<http://buy.kolor.com>

You will find all necessary details regarding the purchase procedure and the available payment options; you will also be able to manage your customer account.

At the end of the purchase process you will receive an email with you invoice in PDF format and the registration key for your purchase. Here is an example of the message being sent:



CREATOR OF AUTOPANO

For the attention of [REDACTED]

Thank you for your purchase on our online store or on a partner's store. We wish you a pleasant use of our products.

This message contains important information. Please conserve it.

### Informations about Autopano Pro 2.0 Mac

#### Download

You can download the latest version of Autopano Pro on the following page:

<http://www.autopano.net/en/buy-autopano/download.html>

#### Documentation and technical support

Take a look at the [Support and Learning Center](#), which contains Autopano Pro manual, training videos and details on several software features:

- [Support and Learning Center](#)
- [Installation and registration](#)
- [Your first panorama](#)

Moreover, forums are at your disposal if you have any problem registering or using Autopano Pro:

<http://www.autopano.net/forum/>

If you cannot find the information you need in the Wiki or on the forums, you can contact us directly via our online form:

<http://www.autopano.net/en/contact-kolor/write-to-us.html>

## Registration key

Here's the registration keys you need for the products you have just ordered

Warning : You have to enter these information exactly as they are written below to register the software. The user code can sometimes be the email address that you used to create your account on this website.

Product	Username	Registration key
Autopano Pro 2.0 Mac	[REDACTED]@aon.at	KAPPP-[REDACTED]G7-IM7KW

Autopano Pro 2.0 Mac	APP-2-mac	1	Excl. Tax: € 99.00 Incl. Tax: € 118.40
Subtotal			€ 99.00
Shipping & Handling			€ 0.00
Tax			€ 19.40
<b>Grand Total</b>			<b>€ 118.40</b>

Your Invoice # [REDACTED] Order # [REDACTED]

[Print your order](#)

#### Billing Information:

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

#### Payment Method:

Card payment

The whole team of Kolor thanks you for your trust.

Support : <http://www.kolor.com/buy/contacts/>

**Kolor**

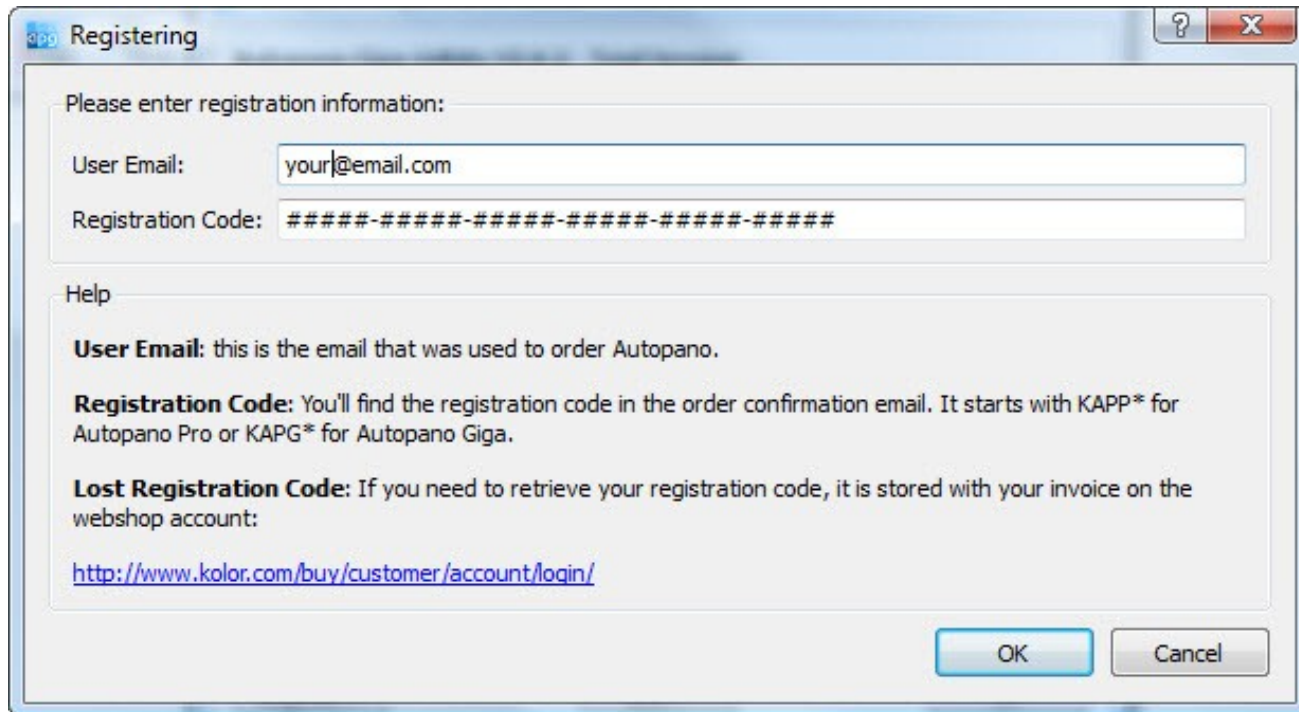
KOLOR SARL - 204, Avenue du parc - 73190 CHALLES LES EAUX - FRANCE  
VAT-ID FR50479247751 - RCS CHAMBERY 479 247 751 00023

## 1.5 Registering

When you first launch Autopano Pro and you did not yet register the software, the following screen will be displayed:



Click on the « Register ? » button to enter the registration information you received in your confirmation email.



Be careful to enter the registration data exactly as it was sent to you.

Done! You have completed the Autopano Pro installation!

# 2 Main Window

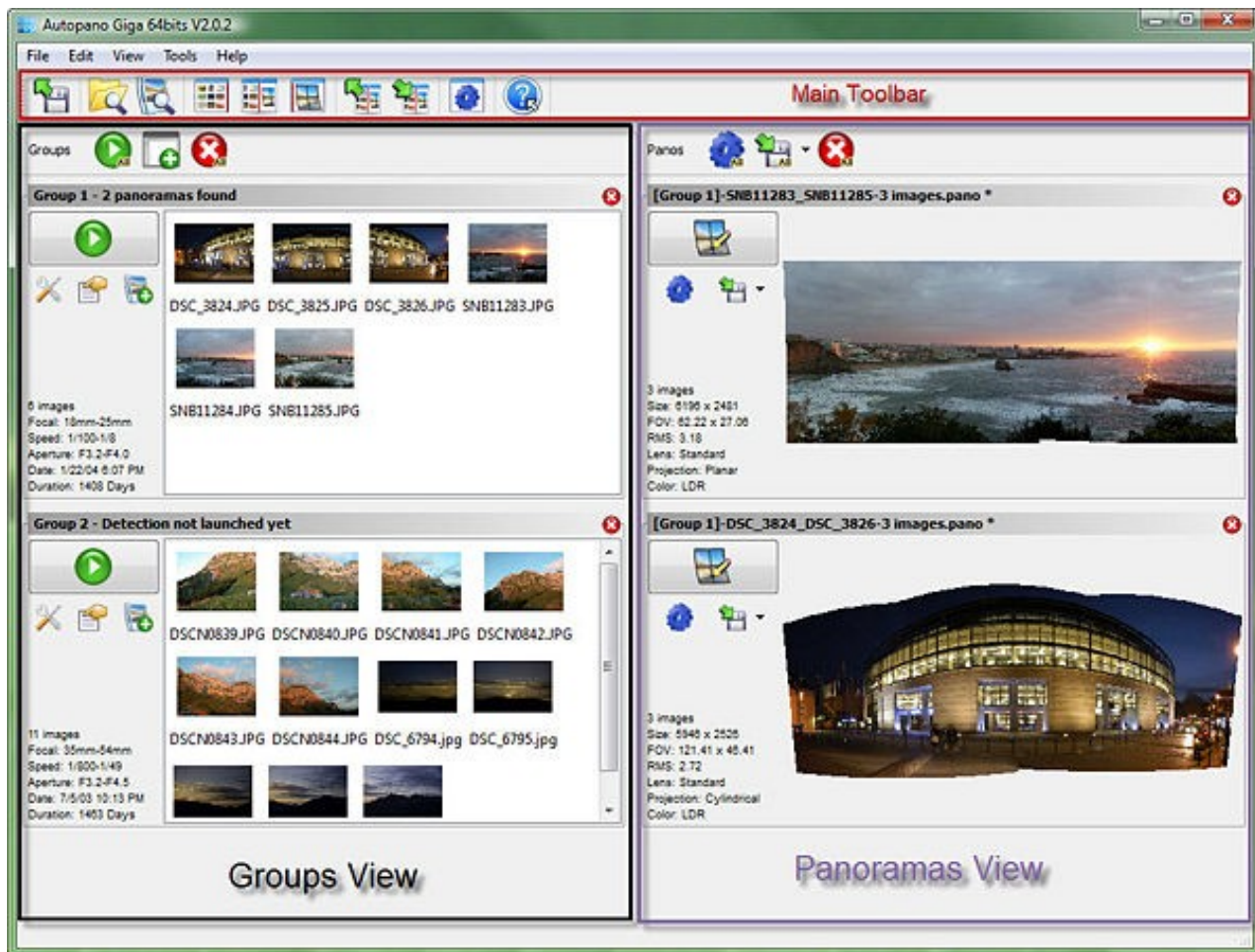
## 2.1 Interface Description

## 2.2 Contents

- 1 Interface Description
- 2 The Main Toolbar
- 3 Project Files (.pano)
  - ◆ 3.1 Opening an Autopano project
- 4 Panorama detection
  - ◆ 4.1 Folder Analysis
    - ◇ 4.1.1 The big picture
    - ◇ 4.1.2 Interface
    - ◇ 4.1.3 Group Creation
  - ◆ 4.2 Picture Analysis
- 5 GUI Layout
- 6 Workspace Management (.apw) (Only available with Autopano Giga)
  - ◆ 6.1 Load Workspace
  - ◆ 6.2 Save Workspace
- 7 Batch rendering

The main interface of the software is divided into 3 main areas:

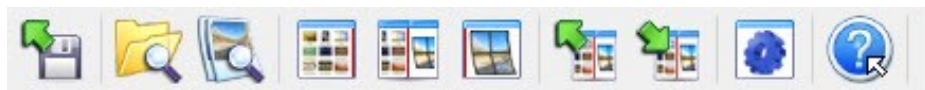
- The **Main Toolbar**: a collection of the most useful tools,
- The **Groups View**: allow the user to manage the various image groups that will make up one or several panoramas,
- The **Panoramas View**: displays the panoramas currently in memory, resulting from a detection or from loading a previously saved project file



 Main Window Screenshot



## 2.3 The Main Toolbar



This toolbar is divided into 4 areas:

- Project files management:
- Panorama detection:
- GUI Layout:
- Workspace management: (Autopano Giga Only)
- Batch rendering:



The last icon allow you to display some help content for each button. Click on this icon then click on the button you need help with.

## 2.4 Project Files (.pano)

The Autopano Pro project file (.pano extension) is a file used to save all the panorama parameters: the list of source images used, the color correction parameters, the rendering file format, etc. It could be useful to keep this file as it will allow you to resume working on a panorama at a later time and do a new rendering without having to go through the detection phase again. This file is a plain text file and can be opened with any text editor.

Autopano Pro also supports other very popular project file types: the PanoTools project file format. You can also import from and export to these file formats.

### 2.4.1 Opening an Autopano project

This button is used to load Autopano Pro project files (.pano extension). Project files are obtained from saving a project after stitching a panorama with Autopano Pro.

Note: Selecting multiple project files is allowed.

## 2.5 Panorama detection

### 2.5.1 Folder Analysis

Using this icon launches the analysis of the content of a given folder, and, if so chosen, the content of its subfolders, looking for images. The analysis will result in the creation of image groups, each producing a single panorama after detection.

#### 2.5.1.1 The big picture

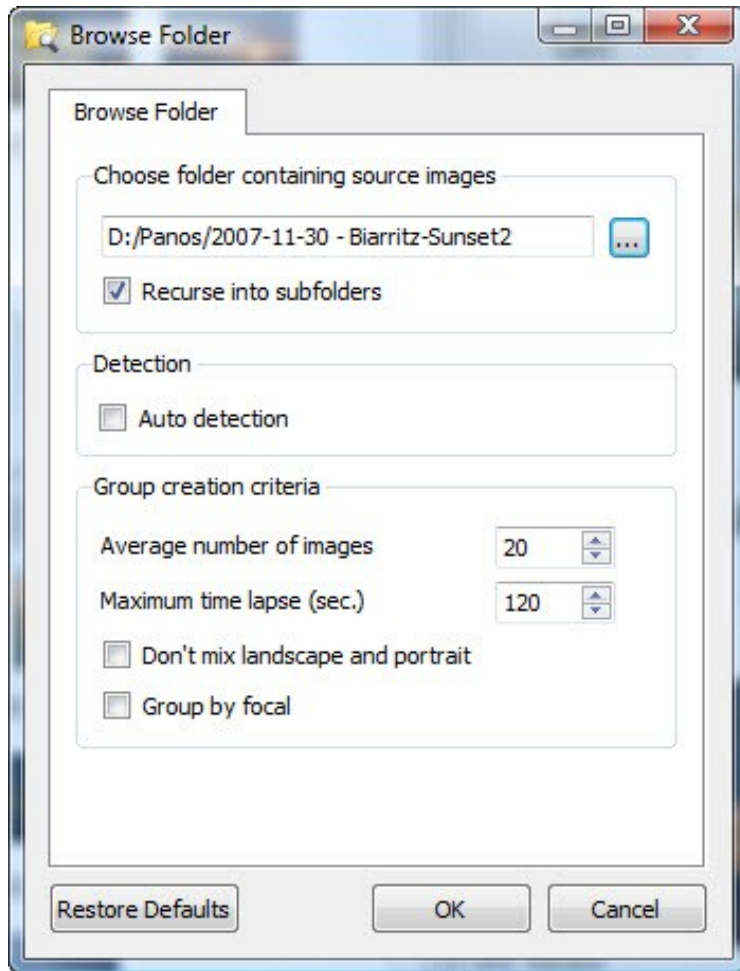
Let's say you just unloaded a bunch of image from your camera's memory card onto your hard drive and you are starting to think that you now need to sort out the images belonging to the various individual panoramas you have been shooting? Well stop thinking! You do not need to do this anymore. Autopano Pro will do that for you! Here is how:

When shooting pictures during a trip, when on vacation, or even on a professional assignment, the precise date and time of the capture is stored along with the image. When shooting a panorama we generally will be standing at a single spot, clicking the individual shots that will make up the final panorama one after another. We then pack up our gears and go to the next shooting location and do it again.

What we get out of this behavior is that the individual images belonging to a single panorama are often shot almost at the same time, within a few seconds of each other at most. If an isolated image is found, meaning there are no other pictures taken within let's say the same hour, it probably means that this particular image does not belong to a panorama.

Our tool will then create groups of images based on the date and time they were shot, using inactivity periods (periods where no pictures were shot) as a separator between two groups.

### 2.5.1.2 Interface



- **Bouton "..."**

This is a *browse folders* button that will allow you to choose the folder you wish to analyze.

- **Recurse into subfolders**

If this box is checked, the analysis will take in account all subfolders contained into the selected folder. Each subfolder automatically resulting into different groups.

- **Auto detection**

Automatically launches the control points detection and display of panorama previews for all newly created groups.

- **Average number of images**

This value will impact the number of images that can make up a group (don't forget that it is still possible after the analysis to move pictures from one group to another, to create new groups and to delete existing groups from the "Image Group" section of the interface).

- **Maximum time lapse (sec.)**

The pictures are scanned in the order they were shot. For a picture to belong to the same group as the previous one, the time differential between the two images must be smaller than the value selected here.

- **Don't mix landscape and portrait**

If this option is checked the groups will not be able to contain both portrait and landscape images.

- **Group by focal**

If this option is checked, the groups will only be able to contain images shot using the same focal length.

### 2.5.1.3 Group Creation

Groups are created by using 2 values : **Average number of images** and **Maximum time lapse (sec.)**. It works this way :

- All images are stored into a big group. The images are sorted by increasing shooting date ( EXIF shooting date time ).
- The algorithm looks for the biggest time lapse between 2 following images.
  - ♦ If this biggest time lapse is already less than the **Maximum time lapse (sec.)**, the algorithm stops because it would say that all images are separated by a time range than is less than this **Maximum time lapse (sec.)**.
  - ♦ If this biggest time lapse is bigger than our limit, it divides the group into 2 new sub groups.
- The algorithm continue to divide groups until the group size reaches the **Average number of images** limit.

Examples :

- **Average number of images** = 1 et **Maximum time lapse (sec.)** = 10
  - ♦ The groups created will only have images that are separated by 10s max. You can get groups with only one image.

- **Average number of images** = 1000 et **Maximum time lapse (sec.)** = 10
  - ◆ Groups will have 1000 images each but you are not sure that time laps between images in group is less than 10s.



## 2.5.2 Picture Analysis

This icon is used to perform a stitching detection for one or several panoramas from manually selected pictures. The new group will appear in the main GUI's left panel along with one or several associated previews in the GUI's right panel.

## 2.6 GUI Layout



: Only displays the groups panel (ides the panorama previews).



: Splits the main GUI into two equal panels: the left panel displaying the groups, the right panel displaying the panorama previews.



: Only displays the panoramas panel (ides the groups panel).

## 2.7 Workspace Management (.apw) (Only available with Autopano Giga)

The **workspace** file (.apw extension) is used to store a list of all open groups and panoramas. This allow for a quick return to a previous state of the workspace, before you closed Autopano Giga for example.

This file is a plain text file and can be opened with any text editor.



### 2.7.1 Load Workspace

Allow you load a workspace from a previously saved (.apw) file.



### 2.7.2 Save Workspace

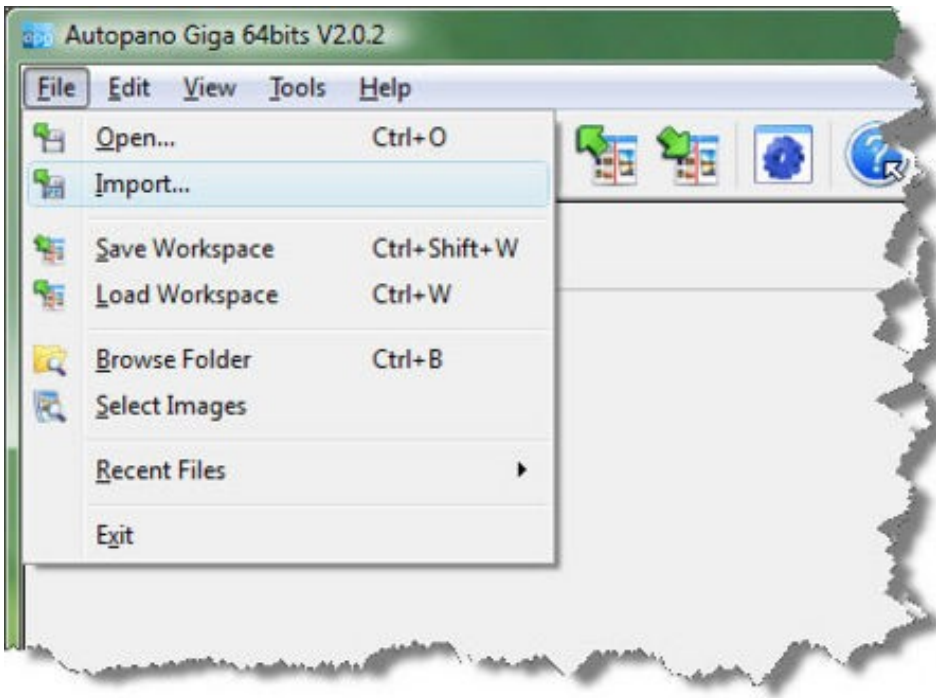
Allow you save a workspace in a (.apw) file.

## 2.8 Batch rendering

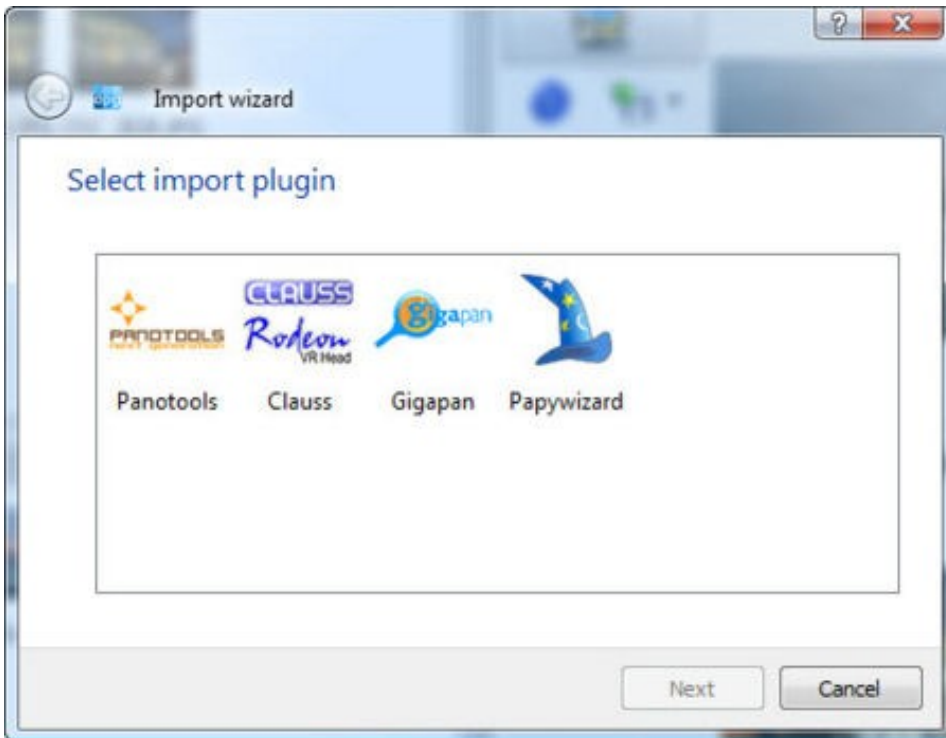


: Using this icon display or hide the **Batch Rendering** window.

### 3 Import...



You can import projects coming from various origins inside Autopano, such as images captured with a motorized panoramic shooting head or projects created with PanoTools.



The import modules are as follow:

Clauss Autopano Giga only.

Gigapan

Papywizard





# 4 Application Settings

## 4.1 Contents

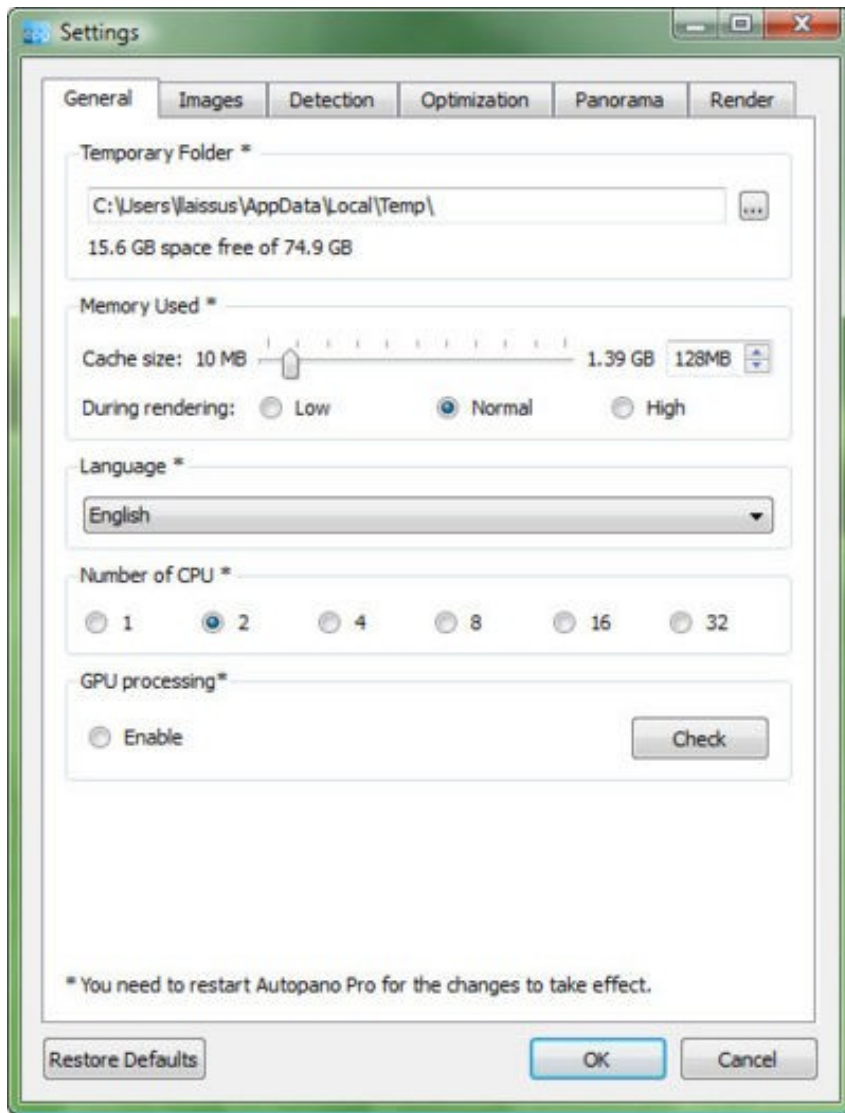
- 1 General
- 2 Images
- 3 Detection
- 4 Optimization
- 5 Panorama
  - ◆ 5.1 Panorama layout
  - ◆ 5.2 Color Correction
- 6 Render

This dialog will allow you to set all the software preferences as well as the default settings for many tools. You can open the dialog using one of the following depending on your operating system:

-  : *Edit Menu, Settings*
-  : *Autopano Pro Menu, Settings*

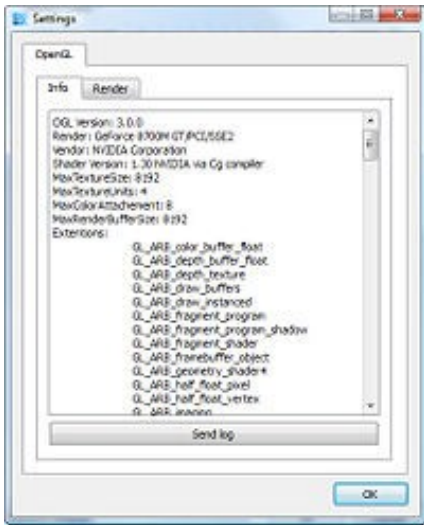
This dialog is divided into 6 tabs.

## 4.2 General

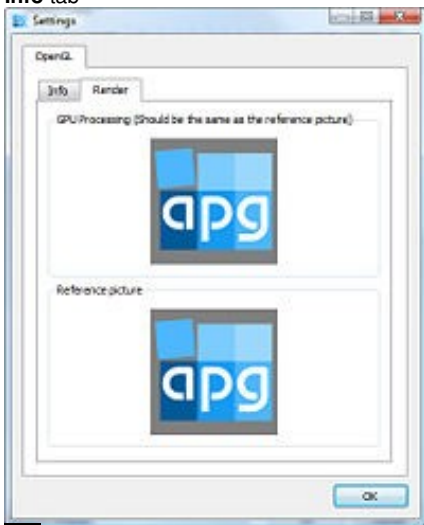


General Tab

- **Temporary Folder:** here you can choose a path to a folder used by Autopano to store its temporary files. If you have multiple physical drives on your computer then choose the one you purchased last as it is probably the fastest drive on your system and the one with the largest amount of free space. The choice you make here can be very important if you are stitching very large panoramas (even more if you use the PSD/PSB multi-layer format).
- **Memory Used:** used to set some parameters influencing the use of the system memory
  - ◆ **Cache size:** this parameter enables you to adjust the amount of RAM used to speed-up the panorama display either in the panorama editor either during the rendering process. The correct value depends on the specifications of your computer but as a rule of thumb using a value of 15% of the total RAM is a good starting point. If the hardware has low RAM ( 1GB or 2GB ) and you want to create big panoramas, it's highly advised to change this setting to a low value ( 50 MB max ).
  - ◆ **During rendering:** this setting changes the rendering engine configuration by allowing it to use different amounts of system memory.
- **Language:** this setting is used to force a different interface language than the OS language in the software.
- **Number of CPU:** the Autopano Pro rendering engine is compatible with modern multi-core and multiprocessors systems. By default the software will choose to use the maximum computing power of the host machine (example: 2 CPUs for a dual core system).
- **GPU processing:**
  - ◆ **Enable :** enable this option to use GPU hardware acceleration and benefit from real time editing in the panorama editor.
  - ◆ **Check:** use this button to check if your video card is compatible with Autopano Pro and/or Autopano Giga. Both images in the "Render" tab should be identical.



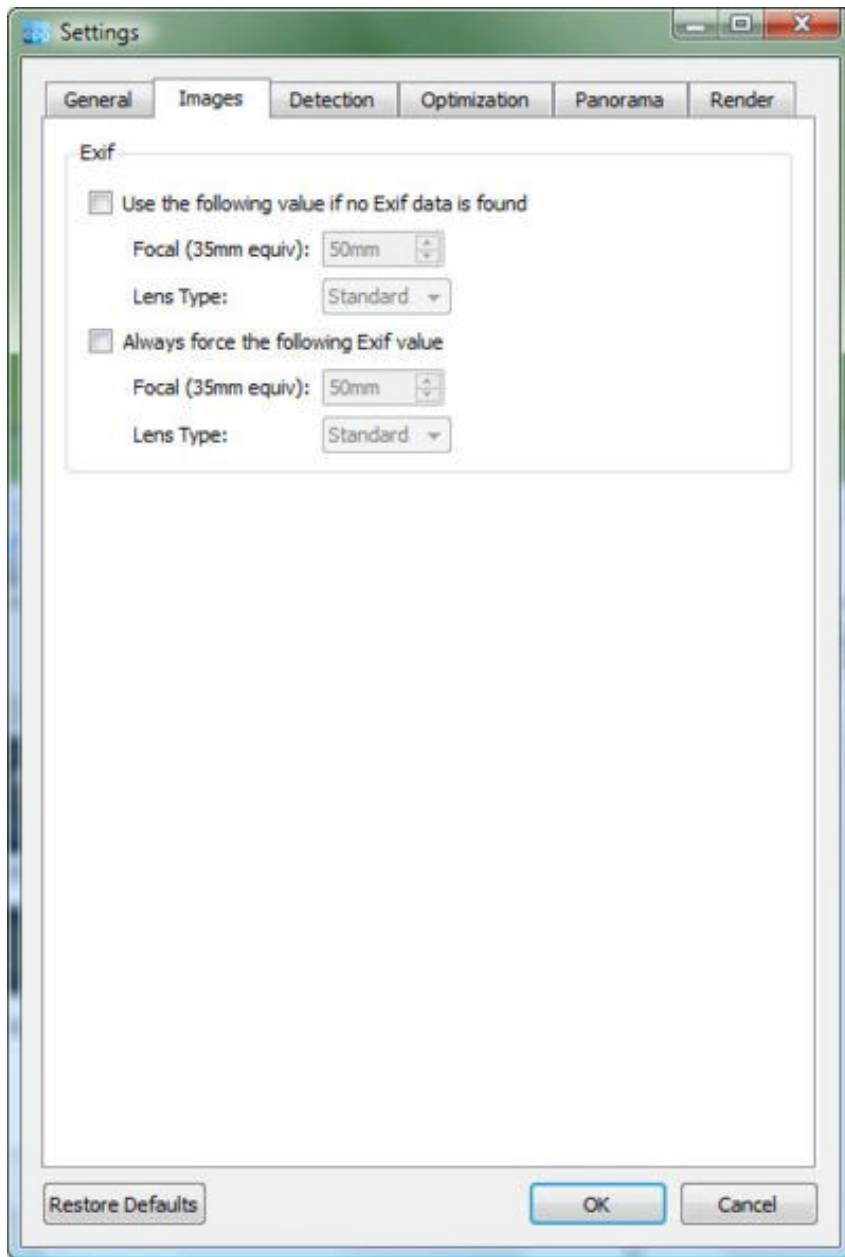
### Info tab



### OpenGL Render tab

## 4.3 Images





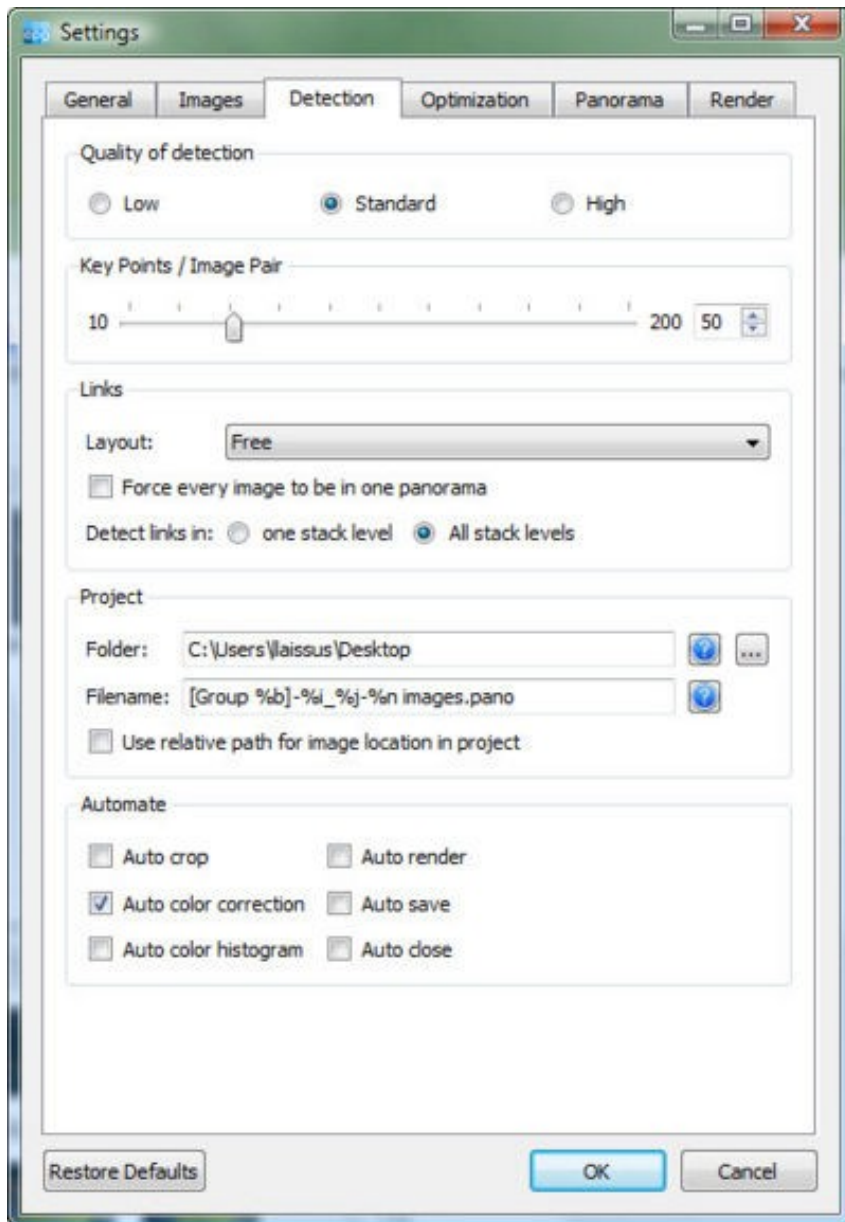
#### Images tab

This set of options is related to the images EXIF data. Note the EXIF data of the original images will not be altered by the modifications you can make here.

Two options are offered:

- **Use the following value if no Exif data is found:** The focal length value and the lens type set here will be applied to images that not have EXIF data available.
- **Always force the following Exif value:** The focal length value and the lens type set here will be applied to all images no matter what (with or without Exif).

## 4.4 Detection



### Detection tab

The settings in this dialog influence the way the source images are stitched together.

- **Detection Quality**

- ◆ **Low** is a good compromise between control points quality and detection speed.
- ◆ **Standard** (*default*) increases control points density but slows down detection speed. In the case of a set of images presenting a small overlapping ratio this option can enhance the detection quality on the overall panorama. It is also used with panoramas presenting a lot a bracketing.
- ◆ **High** very slow, mostly reserved to desperate cases (? worth a try before giving up).

- **Control Points / Image Pair** : This is the number of control points used per image pair. Influences the number of control points exported to PanoTools as well as the overall detection quality.

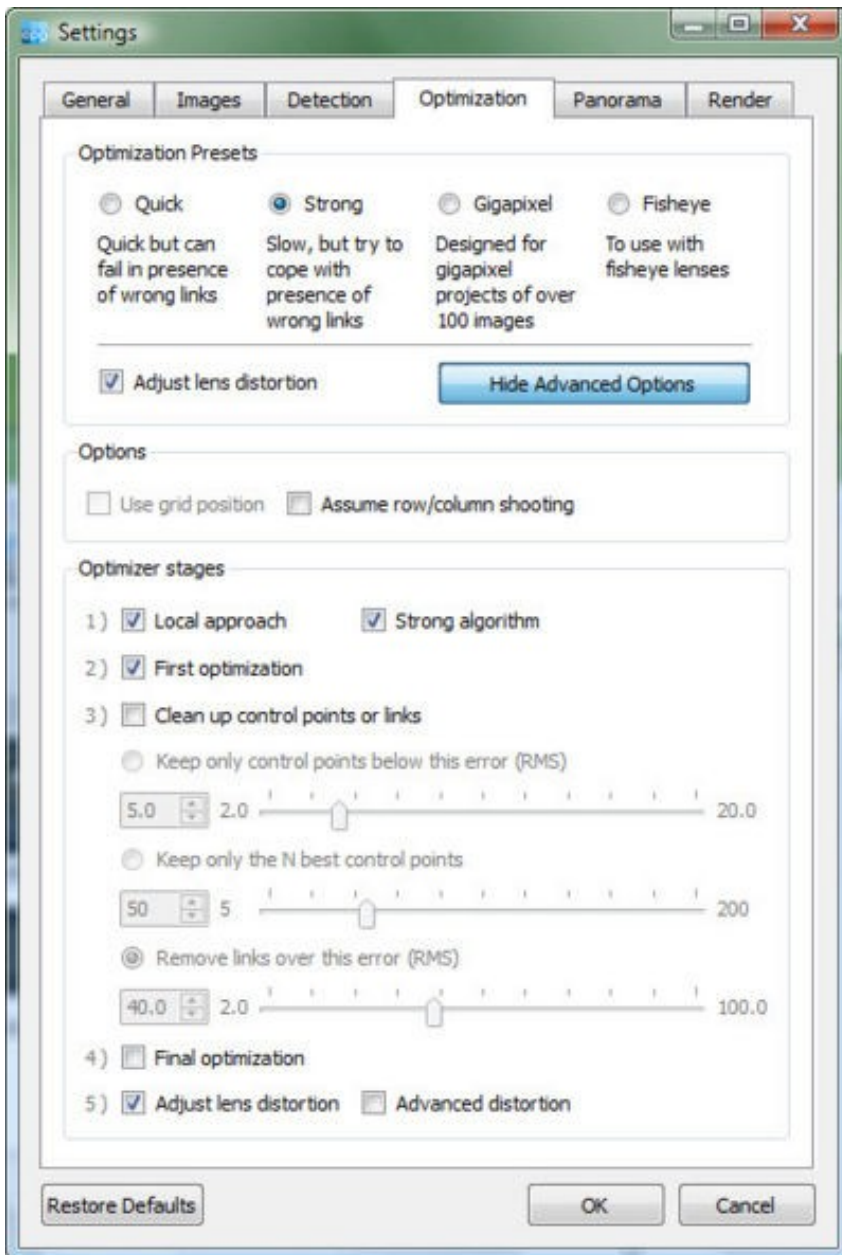
- **Links Layout:**

- ◆ **Free** (*default*): This setting applies no shooting constraint (several rows and columns) to the detection process. Autopano is looking for all possible links between all images. It is possible that when using this mode the software will come up with ?real false? links meaning that some images are indeed linked because they are very similar but in fact are not located beside one another (Example: a courtyard can present a lot of similarities because of its architectural symmetry). It will then be necessary to correct those wrong links using the [Control Points Editor](#).
- ◆ **Single Row or Column**: This only applies when the source images were shot consecutively. For example from left to right; in a row. Using this mode avoids the occurrence of ?real false? links resulting from image similarities.
- ◆ **List all Models** : Works with the [Extended Save As...](#) This makes possible to use the links found between the images in a previous detection as a template for a new detection (assuming the source images were shot in the same pattern) in order to avoid ending up with real ?false? links.

- **Force every image to be in one panorama**: This option is useful when, as it happens with some panoramas, one or several source images are left out. This does not per say enhance the detection quality but instead will force the software to include this or these ignored image(s) in the panorama even if they do not present any links with the other images.

- **Detect links in:**
  - ◆ **One stack level** (*default*): The software will look for all possible links between all images belonging to the same stack.
  - ◆ **All stack levels:** Autopano will look for all possible links between all images.
- **Project:** You can here change the target folder along with the syntax used to name the project files.
  - ◆ **Folder:** the target folder where the project files will be saved when using the *Save and close* auto mode
  - ◆ **Use relative path for image location in project:**
  - ◆ **Filename:** the name of the .pano project file is generated using a special syntax template entered here.
- **Automate:** Autopano can, by itself and in a fully automated way, produce large quantities of panoramas. This set of options let you choose the software default behavior.
  - ◆ **Auto crop:** the panorama is automatically cropped to leave no empty area inside the resulting image boundaries.
  - ◆ **Auto color correction** (*default*): automatically compensate for color variations between source images.
  - ◆ **Auto color histogram:** apply an auto color level filter.
  - ◆ **Auto render:** automatically launch the final rendering process once the panorama detection task is completed.
  - ◆ **Auto save:** automatically save the panorama once the detection task is completed.
  - ◆ **Auto close:** automatically close the panorama once the detection task is completed. This option is often combined with *Auto save*.

## 4.5 Optimization



Onglet **Optimization**

This set of parameters determines how the panorama will be optimized. It is during the optimization step that each image position is computed based on the control points it holds. By default only the optimization profiles are displayed in the dialog. The Advanced Options are only displayed if you click on the "Show Advanced Options" button.

Four (4) optimization profiles are available:

- **Quick:** this will perform a very fast optimization that can possibly fail if some bad image links exist in the panorama.
- **Strong:** (default) suited for most stitching projects. This profile leaves room for intervention in case some bad links exist but, as a trade-off, is slower.
- **Gigapixel:** select this profile for all projects over 200 images.
- **Fisheye:** select this profile for any project using fisheye images.

These profiles are presets for the several optimization steps.

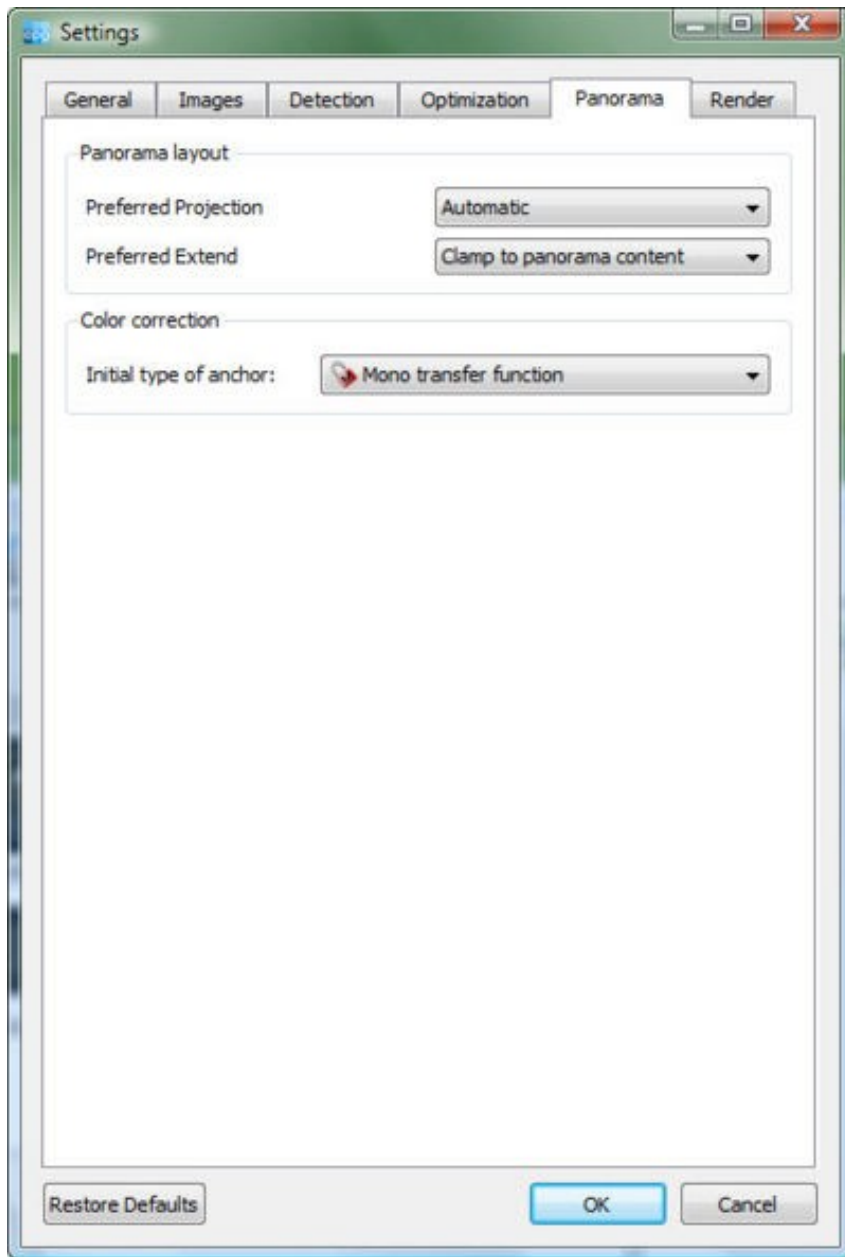
- **Options**

- ◆ **Use grid position:** this option will only be available after an import from a panoramic shooting head that will provide the images coordinates (typically Papywizard or Clauss). This option will then be active and will let the optimization engine know if it needs (or not) to take the images coordinates in account during the optimization process.
- ◆ **Assume row/column shooting:** was the shooting performed in a row/column pattern or not? This option is activated for panoramas issued from a Gigapan shooting head. We suggest using this option only in that particular case because this mode needs enhanced accuracy during the shooting process (n row, p column). It is best not to use this option if you find yourself with an extra source image in one row or in one column, or if the spacing between two consecutive rows varies too much.

- **Optimizer stages**

- ◆ **1) Local approach:** this is a very fast algorithm that allow for a local pre-location of the images.
- ◆ **2) First optimization:** this is the main optimizer, taking all links into account in a global way.
- ◆ **3) Clean up control points or links:**
  - ◇ **Keep only control points below this error (RMS):** useful when only quality matters.
  - ◇ **Keep only the N best control points:** useful when only the number of control points per image matters.
  - ◇ **Remove links over this error (RMS):** useful when only links quality matters.
- ◆ **4) Final optimization:** the same main optimizer used in stage 2 is called upon (if it hasn't been yet) or recalled upon (to take into account the deletions performed in stage 3).
- ◆ **5) Adjust lens distortion:** this option allows for lens distortion correction (very useful on short and medium focal length). It is better to uncheck this option if you are stitching a gigapixel panorama as it will slow down the detection process.
  - ◇ **Advanced distortion:** allow for better distortion correction on fisheye lenses

## 4.6 Panorama



#### Panorama tab

These options influence the panorama's creation once the detection process is completed. They act on the panorama appearance and define the default color correction settings.

#### 4.6.1 Panorama layout

- **Preferred Projection:**

let you choose the default **projection** type:

- ◆ **Automatic:** the software automatically chooses the most suitable **projection** type among Spherical, Cylindrical and Planar. The choice is determined by the panorama's FOV.
  - ◇ If the horizontal FOV is smaller than 120° and the vertical FOV is smaller than 90° then the Planar projection will be chosen.
  - ◇ If the horizontal FOV is greater than 120° and the vertical FOV is smaller than 90° then the Cylindrical projection will be chosen.
  - ◇ In all other cases the Spherical projection will be the preferred choice.

You can force a projection type to be the software's default. Be careful however, as if your panorama is 360° and you choose a Planar projection, only a small part of the panorama will be displayed.

- **Spherical projection**
- **Cylindrical projection**
- **Planar projection**

- **Mercator projection**

- **Preferred Extend:** allow to choose the default panorama size.

- ◆ **Clamp to panorama content:**

- the final size of the panorama will be the full area containing no empty pixels.



- ◆ **Maximum projection range:**

- the size of the panorama will be the full projection mode surface.

- The projection area for a Spherical projection is 360°x180°, for a Cylindrical projection 360° x 162° maximum, and 162° x 162° maximum for a Planar projection.

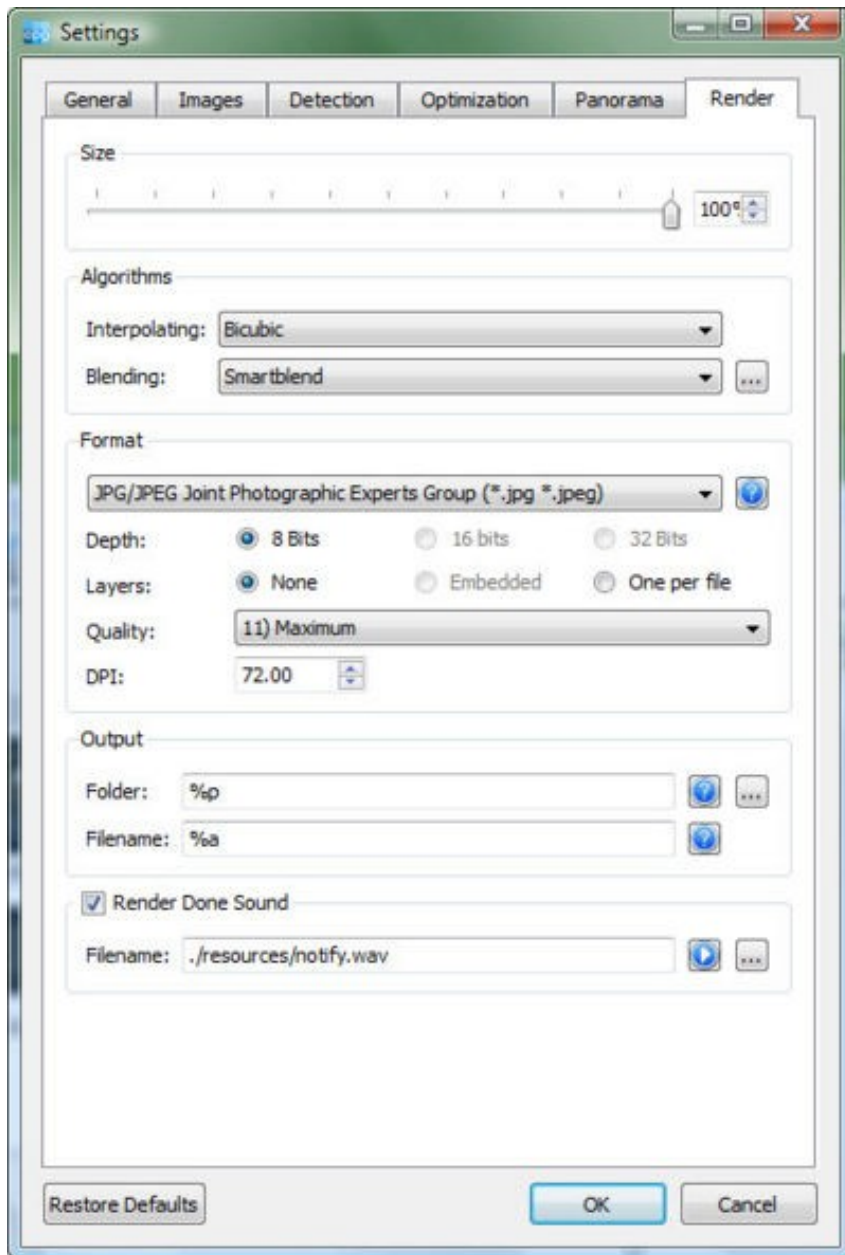
- This setting is useful if you always want to generate 360°x180° panoramas even with partial panoramas that do not cover the whole projection area (360°x91.03°).



## 4.6.2 Color Correction

This setting allows you to choose the default **color correction** mode when the **Auto color correction** is activated.

## 4.7 Render



### Render tab

At first this tab seems to duplicate the *Render Panorama* dialog. In reality this tab enables you to set the default values that will populate the *Render Panorama* dialog when clicking on the *Render* button. Therefore, we will find in this tab almost the same parameters as in the *Render Panorama* dialog:

- The size expressed in percentage (percentage in regard of the size of the panorama if the source images are neither shrunk nor enlarged).
- Interpolation mode choice.
- Blending mode choice
- Output file format for the rendered panorama.

To get a detailed description of these parameters please check the [Render Settings](#) page.

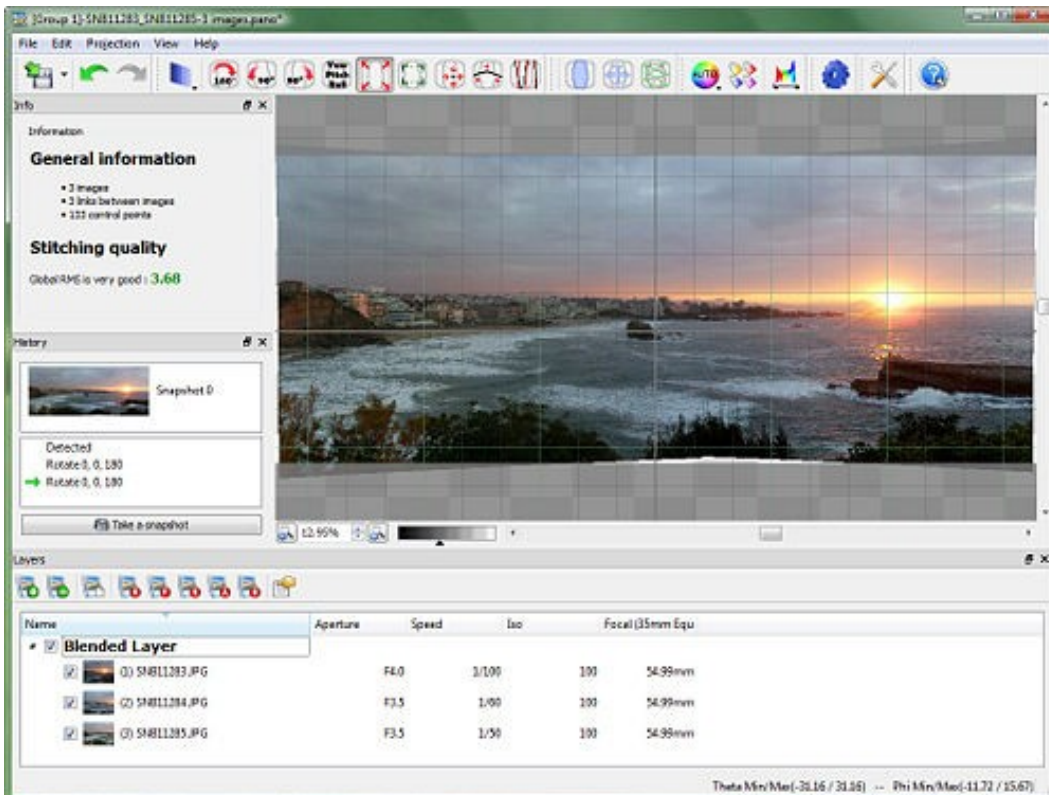
- **Output:** these two boxes allow you to choose where the output file will be saved and how it will be named.
  - ◆ *Folder:* here you can specify the target folder where you want the final image saved.
  - ◆ *Filename:* default syntax used to name the output file (click on the "?" icon to obtain the syntax explanation).
- **Render Done Sound:** easy enough to understand, this allows you to have your computer play a sound (or not) when the rendering process is completed. Sound files in .wav format are supported.

# 5 Panorama Editor

## 5.1 Contents

- 1 Interface Overview
- 2 The Preview Area
- 3 The Toolbar
- 4 Project Files
  - ◆ 4.1 Save
  - ◆ 4.2 Save As ...
  - ◆ 4.3 Extended Save As ...
  - ◆ 4.4 Save As Template ...
  - ◆ 4.5 Export to Panotools
- 5 History
- 6 Editor Settings
  - ◆ 6.1 Editor Tab
- 7 The Toolbar Section

## 5.2 Interface Overview





## Panorama Editor Screen Capture

The Panorama Editor Window interface is divided into 6 main areas:

- The Toolbar: offering a collection of the main tools (saving, history, geometrical correction, color correction, etc.)
- The Preview area: displaying a preview of the panorama, allowing to zoom in and to move the panorama.
- The Layers area: allow for images classification based on several parameters, also allow for deletion of unwanted images.
- The Status Bar: displaying information related to shooting conditions. This information is useful to monitor the coherence of the capture. For example, for a complete panorama, the FOV should return a Theta Min/Max  $-180^{\circ}/180^{\circ}$  and a Phi Min/Max  $-90^{\circ}/90^{\circ}$ .
- The History area: allowing to move backward and forward in the edition history and to take snapshots of the current editing stage.

## 5.3 The Preview Area



Zoom type in GPU mode

The Preview Area allows you to zoom in and out the panorama.

- To move the panorama:

1. Press and maintain the keyboard spacebar down then left click on the panorama and move it around while keeping the left mouse button down.

- To zoom:

1. Press and maintain the keyboard Alt key down (or Apple key on a Mac) then use the mouse scroll wheel to zoom in and out.
2. Or use the graphical tools located right under the panorama preview.

Note:

- Some tools are using the keyboard and/or the mouse, like the *Layer View* mode.
- It is also possible to adjust the panorama preview size to the window size by selecting the "Fit Pano on Screen" zoom setting or using the Ctrl+0 keyboard shortcut..

You can play with the various types of zoom provided to determine which one fits best into your workflow.

## 5.4 The Toolbar



- Project Files :
- Geometry Editing :
- Selecting and moving images:
- Control Points Editor :
- Color and Brightness:
- Render Settings :
- Editor Settings :
- Contextual help: . Click on this icon then click on the icon you need help with.

## 5.5 Project Files

The Autopano Pro project file (.pano extension) is a file used to save all the panorama parameters: the list of source images used, the color correction parameters, the rendering file format, etc. It can be useful to keep this file in order to come back to a panorama at a later time and render it again without having to go through the detection process again. This file is a plain text file and can be opened with any text editor.

Autopano Pro also supports other very popular project file types: the PanoTools project file formats. You can also import from and export to those file formats.

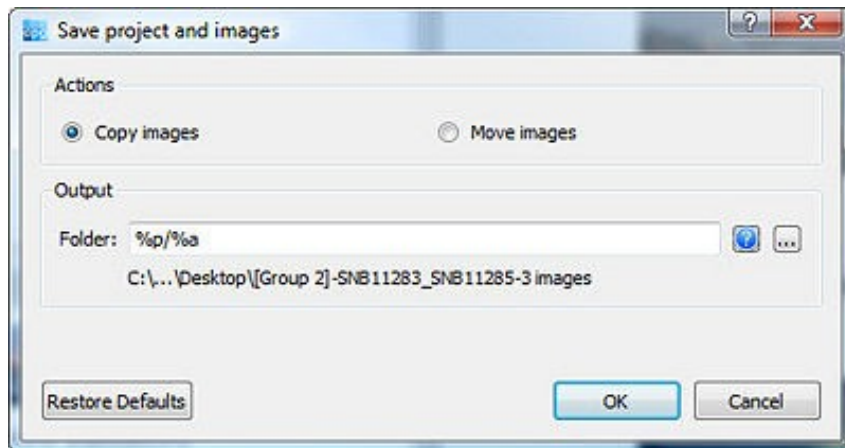
### 5.5.1 Save

Saves the project with its current name. Combine with **CTRL keyboard key**: the button will then behave as a "Save as ?" button .

### 5.5.2 Save As ...

Saves the project while specifying the saving location and the name it should be saved as.

### 5.5.3 Extended Save As ...



#### Extended Save As...

Saves the project while specifying the saving location and the name it should be saved as. On top of that you can copy or move your source images to a target directory defined using the syntax entered in the **Path** input box. This allow for a per project image archival in a very simple way.

The path is based on a special and highly efficient syntax model allowing for example to specify the project directory name as well as the name of the project itself.

<b>%p</b>	Project directory
<b>%a</b>	Project name

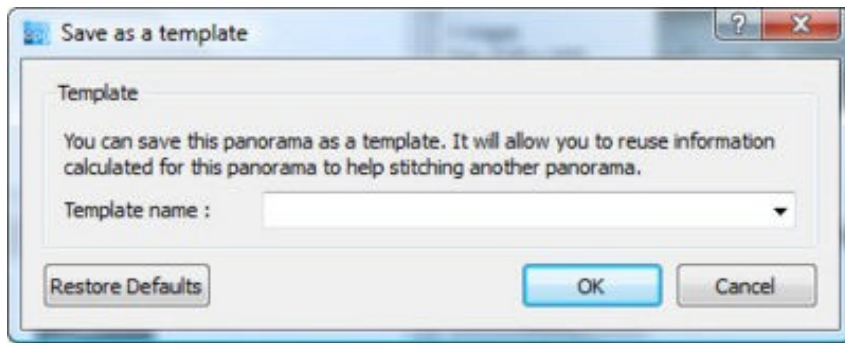
The default syntax model is as follow: "%p/%a" translating in the following example:

**C:\...\Desktop\[Group 1]-SNB11285-3 images**

%p = C:\...\Desktop

%a = [Group 1]-SNB11285-3 images

### 5.5.4 Save As Template ...



### Save As Template ...

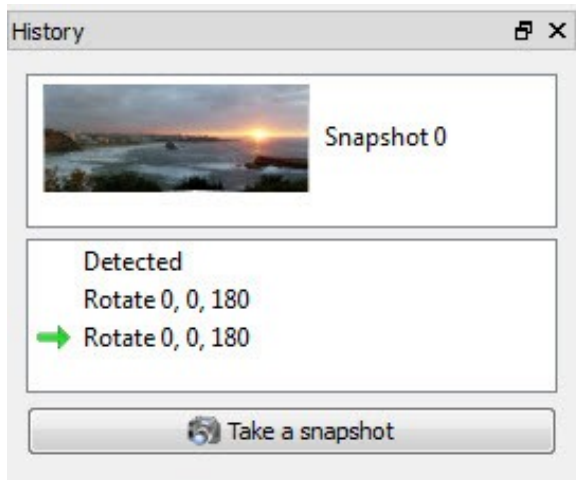
This option will allow you to save the detected image links for this project. It will then be possible to use the same links as a template for a similar stitching. The link pattern to be used can be chosen in the **Detection** option (Free, Single Row or Column, List all Models?).



### 5.5.5 Export to Panotools

Using this option will export the Autopano project into a format usable by the PanoTools suite of tools: Autopano can read and write the following project file formats: PTGui (.pts file format), PTAssembler (.ptp file format) and Hugin (.pto file format).

## 5.6 History



### History

You need to undo the last few actions performed on your panorama as you are not satisfied with the result? No problem! Just click on the "History" button. The "History" dialog will pop up and display a list of all the steps performed since the panorama was created or opened. All you need to do is click on the desired step to restart from there.

The dialog will also allow you to take a snapshot of the panorama at any given time. Just click on the "**Take a snapshot**" button in the History dialog. You will then be able to restore the snapshot state by clicking on the desired **Snapshot Thumbnail**.

Keep in mind that exiting the Panorama Editor will discard the History information. If you reopen the same panorama, only its last version will be displayed in the History.

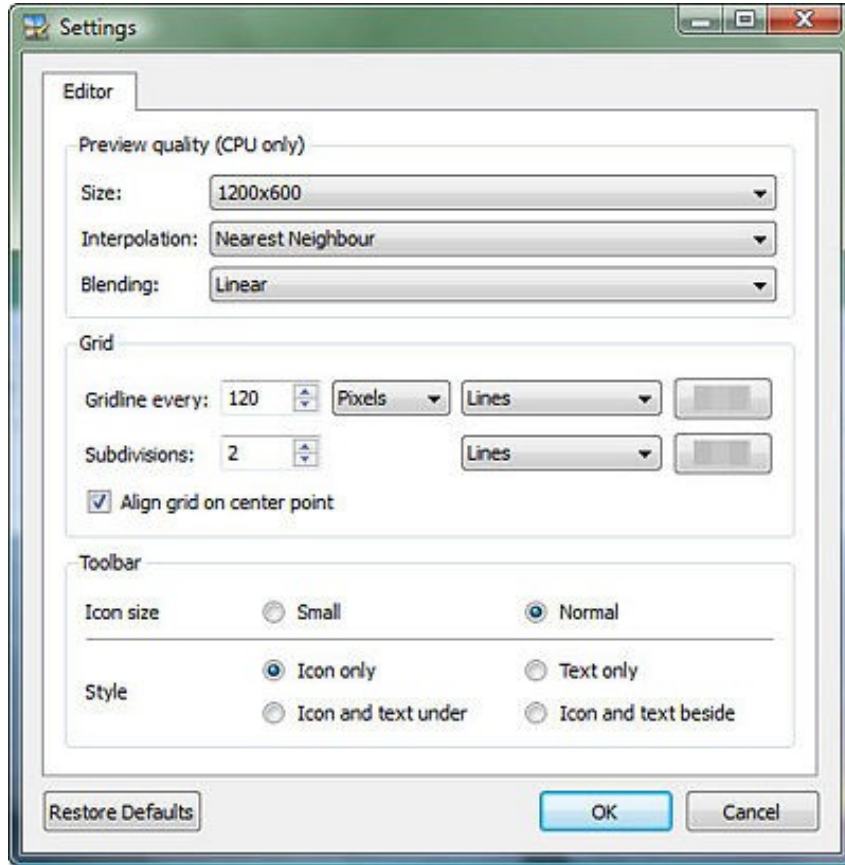


Tip:

- You can take a snapshot every time you save your work to keep track of your progression.
- You can also use this snapshot feature to compare two different color **levels** settings for example.

## 5.7 Editor Settings

### 5.7.1 Editor Tab



#### Editor Settings

- **Preview quality** (CPU mode only)

This set of parameters only influences the quality of the *preview* and the way the editor works. The parameters influencing the quality of the *final image* are set in the *Launch Render* dialog or in the *Render* tab of the *Application Settings* dialog.

- - ◆ **Size**: here you can set the panorama preview size (in pixels) inside the panorama editor window (refreshed after each adjustment of an editing parameter).  
The default display size is 1200 x 600, the highest quality setting being 3200 x 1600. Since any alteration of this setting is taken into account in real time and because it can be modified through the *Edit* menu of the editor window, the best thing to do is to reduce the quality when the preview's refresh time is becoming too long and to increase the quality when individual pixels become too visible (the interpolation and the blender also affect the panorama editor preview refresh time). Increase the preview quality if you need to zoom into the image otherwise just leave the default value on.
  - ◆ **Interpolation**: let you determine how the pixel values of the preview are computed from the source images pixels.
  - ◆ **Blending**: let you choose how the images are blended together in the overlapping zones. Several blenders are available inside Autopano but only some of them are available for the preview:
    - ◇ *None*: no blending, the "top image" is visible.
    - ◇ *Linear*: this mode is fast and generates good quality results.
    - ◇ *Multiband*: slower but better quality.

- **Grid**

- ◆ This set of options is used to define the grid's properties, such as the type of lines used and their spacing.

- **Toolbar**

This setting will alter the visual aspect of the editor's toolbar.

- - ◆ **Icon size**: changes the size of the toolbar icons.
  - ◆ **Style**: changes the style of the toolbar buttons.

## 5.8 The Toolbar Section

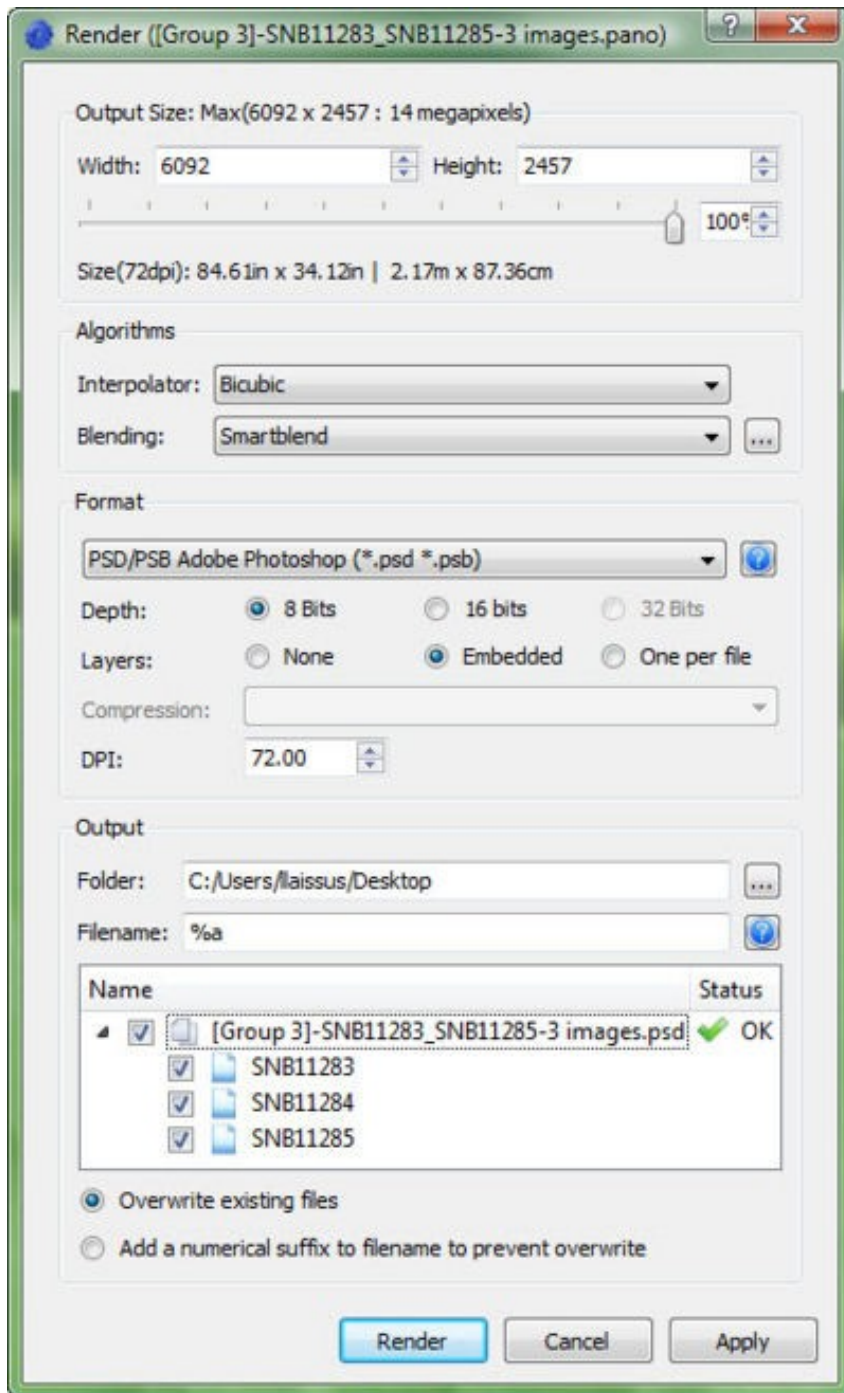
This set of options controls the size of the icons displayed in the Panorama editor's toolbar. You can also choose to display some descriptive text beside, and under the icon, or choose to have only text displayed and hide the icons.

# 6 Render Settings

## 6.1 Contents

- 1 Output Size
- 2 Algorithms
- 3 Interpolator
- 4 Blender
- 5 Formats
  - ◆ 5.1 Notes
  - ◆ 5.2 Layers:  
None /  
Embedded / File
  - ◆ 5.3 EXIF Data
- 6 Output
- 7 Validation
- 8 About our Rendering Engine
  - ◆ 8.1  
Cell-Rendering
  - ◆ 8.2 VFW, virtual  
file writer

The *Render* dialog will allow you to set the panorama rendering parameters.



## 6.2 Output Size

There are 3 ways to choose the output size of the panorama:

- With the slider (percent of the max. size)
- By entering a numerical value for the desired width (value expressed in pixels)
- By entering a numerical value for the desired height (value expressed in pixels)

The panorama's maximum size is given on the first line (taking into account any use of the *Crop* tool). This maximum size (100%) is the resulting size of the source images after stitching. At the maximum size, all the details recorded when shooting the scene will be restituted in the final image.

Notes: don't feel pressured to always use 100%. When working with a Planar Projection or Cylindrical Projection with a FOV wider than 90°, the pixels located in some specific areas of the resulting image will abnormally be stretched (right and left edges in Planar, top with Cylindrical). If we choose 100% the image sharpness cannot be constant across the resulting image, it can be a good idea to take this fact into account and reduce the value to 70% or even 50%. As far as the time needed to render the final image, surface determines the computing load: going from 100% to 30% will give you a 1 to 10 increase in rendering time!

**Maximum size with multiple focal lengths:** when working with a panorama using source images shot at various focal lengths, the maximum size of the resulting image is calculated based on the source image with the highest amount of details (i.e. the longest focal length) and this image is given a ratio of 1 (i.e. for one pixel of this image, there will be one pixel in the final panorama). Therefore, the pixels belonging to the source images taken with shorter focal lengths will be stretched in the rendering process.

## 6.3 Algorithms

The Blender and Interpolator are two algorithms used to manage the global output quality of the panorama.

## 6.4 Interpolator

The interpolator is used to reproject the source image's pixels on the panorama. The Interpolator's quality will then influence the sharpness of the rendered panorama.

- **Nearest neighbor:** to be used for testing purposes only because of the large amount of artifacts it produces. As a tradeoff it's the fastest of all.
- **Bilinear:** represents a decent quality/speed ratio.
- **Bicubic:** if you don't know which one to pick this is the one you should be using. Any differences from Bilinear will be hardly visible to the naked eye, but can be seen on highly contrasted lines. It is the default recommended setting.
- **Bicubic Sharper:** same formula as Bicubic with some strength added (same as bicubic, only a touch stronger). This sampling mode is the same as the one found in the "Image Size" dialog, in the "Resample Image" drop-down of Adobe Photoshop.
- **Bicubic smoother:** same formula as Bicubic with less strength (same as bicubic only a touch lighter). This sampling mode is the same as the one found in the "Image Size" dialog, in the "Resample Image" drop-down of Adobe Photoshop.
- **Spline36:** the use of this powerful interpolator is to be reserved for cases where heavy post-processing will take place. To the naked eye, there is absolutely no visible difference with Bicubic.
- **Spline64:** more powerful, slower but generally even better than Spline36 (if you can see the difference!). Same as for the Spline36 interpolator: to be reserved for cases where heavy post-processing, including reprojecting and successive image transformations will take place.

## 6.5 Blender

The Blender is an algorithm used to combine several reprojected images (source images projections on the panorama). The Blender is generally used on the areas where the sources images overlap, but not only. There can be cases where it will modify some pixels outside of the overlapping areas (i.e. where only one input source of pixel is available). The primary goal of the Blender is to combine the source images (two, sometimes more) and process the overlapping areas to produce a seamless panorama.

Several blending algorithms are available:

- **None:** no blending is performed; the "top picture" is used. The stitching seams are obviously visible (geometry and/or brightness).
- **Linear:** : this mode is very fast and can be a good compromise between quality and speed if you are not too demanding on quality.
- **Multiband:** this slower mode will produce much better results than the "Linear" mode. The transitional areas between images will hardly visible. However this mode does not take into account objects that could have moved from one shot to another and some "ghosting" can occur.
- **Smartblend:** this blender combines a Multiband blender and picture analysis engine in order to identify common objects present in the source images (a moving object, a strong line,?). Based on the results of this analysis, Smartblend tries to keep the features common between images (edges, lines, curves,?) and automatically discard objects that have moved between shots. Even though much slower than the other algorithms, this blender produces a much higher rendering quality.  
**Be aware:** this blender is not HDR compatible yet.

## 6.6 Formats

- **File format**

### Options Notes JPEG

- *Compression:* quality ranging from 1 to 12
- *Bit depth:* limited to 8bits (discards the alpha channel)
- Maximum size: 64,000 x 64,000 pixels.  
Be aware that Adobe Photoshop will refuse to open any valid JPEG file larger than 30,000 pixels.

### PNG

- *Compression:* ranging from 1 to 7
- *Bit depth:* 8 or 16bits (keeps the alpha channel)
- Maximum size: 64,000 x 64,000 pixels

### PSD / PSB<sup>[1]</sup>



- *Bit depth*: 8 or 16bits with alpha channel
- Can manage embedded layers
- Maximum size: 300,000 x 300,000 pixels

## TIFF

- *Bit depth*: 8 or 16bits with alpha channel
- *Compression*: none, RLE, LZW, JPEG, ZIP<sup>[2]</sup>
- Maximum size: none
- Saving a multilayered TIFF file will allow you to open the file with GIMP, but not in Photoshop. In order to be able to touch up the final in Photoshop it is best to save the output as a multilayered PSD file.
- 16 bits TIFF files are not compatible with some software programs.

## HDR<sup>[3]</sup>

- *Bit depth*: 32 bits
- *Compression*: none, RLE
- Maximum size: none

### 6.6.1 Notes

1. ? The **PSD** file format is the traditional Adobe file format, supported by all versions of Photoshop and by many computer programs. The **PSB** file format is another Adobe file format, recently introduced, and not as popular as the PSD format. It was introduced after version 7.0 and is not supported in 7.0 and earlier version of Photoshop. It was introduced in 2003 and is supported in Photoshop CS and CS2. This format is actually an extension of the PSD file format developed to store larger images, allowing the possibility of storing huge images when we think in terms of conventional image sizes. So, when the final panorama size is over 30,000 pixels or when the resulting file size is over 2 GB, Autopano Pro will **automatically** select the PSB file format instead of PSD.
2. ? The various compression modes are not equal in terms of quality. It is strongly recommended to avoid the LZW compression with a 16bits TIFF file as the resulting **compressed** file will be **larger** than a **non compressed** file. It is also not a good idea to choose the JPEG compression, as it will, just as with a regular jpeg file, introduce strong limitations into the file (no alpha channel, max. size quite small). The good choice remains the ZIP compression.
3. ? This file format can be opened with Photoshop CS 2 and by ?Tone Mapping? software like Photomatrix or FDRTools.

### 6.6.2 Layers: None / Embedded / File

When performing a rendering with Autopano Pro, it is sometime useful to reproject the totality of the surface of the stitched source images to, in a second time, edit the resulting panorama with an image processing software.

This can be done with all available file formats, except that some file formats will support embedded layers within a single file (PSD/PSB) and some won't. Three options are provided to manage embedded layers:

- *None*: none of the reprojected source image will be kept.
- *Embedded*: this option will be enabled if supported by the selected file format. In this case each individual source image will be added to the rendered file as an separate layer.
- *File*: each individual source image will be rendered in a separate file; you will obtain one file per image.

The color and brightness corrections applied to the panorama are also applied to the individual layers: Color Correction, Filters and Levels are applied.

In the other hand the *Blender* is not active on the source images; therefore it has no effect on the resulting individual layers. This, even if surprising in the first place, is absolutely necessary. This will translate into color and brightness variations between the different layers themselves, and also between the layers and the *background* layer (the resulting stitched panorama is assigned to the background layer in Photoshop).

The layers will be arranged correctly, barrel and pincushion distortions are corrected.

### 6.6.3 EXIF Data

For the JPEG, TIFF and PSD/PSB file formats, Autopano Pro will store the original Exif data (found in the source images) into the rendered file. This allow for tracing the original shooting conditions. It also adds some improvements:

- ImageDescription (0x010E): "Stitched Panorama"
- SoftwareUsed (0x0131): "Autopano Pro"
- FileChangeDateTime (0x0132): the panorama's rendering date
- UserComments (0x9286): A short summary for describing the panorama, as it appears in the Panorama Window.

Notes: at the present time, no calculation is being made to compute the equivalent focal length of the panorama. We focused more on keeping the original shooting condition rather than producing numerical values for the resulting panorama.

## 6.7 Output

This area of the dialog will allow you to choose a path and a filename for the resulting panorama.

- **Path:** Easy! This is the file folder where the resulting file will be stored.
- **Filename:** Well? it becomes a little more complicated but very powerful. Instead of giving always the same filename we came up with a system that generates the file name using a powerful syntax. This system will allow you, for example, to specify the height \* width, the interpolator or blender used, etc. inside the produced filename. The syntax is as follow:

<b>%i / %I</b>	Short/long name of the first image of the panorama
<b>%j / %J</b>	Short/long name of the last image of the panorama
<b>%n</b>	Number of source images
<b>%s</b>	Render size (Ex: 11,254 x 2,541)
<b>%f</b>	FOV (Ex: 25.6° x 14.3°)
<b>%p / %P</b>	Short/long name of projection mode used <ul style="list-style-type: none"> <li>• S = Spherical</li> <li>• C = Cylindrical</li> <li>• P = Planar</li> </ul>
<b>%t / %T</b>	Short/long name of the interpolator used <ul style="list-style-type: none"> <li>• NN = Nearest Neighbor</li> <li>• LI = Bilinear</li> <li>• CI = Bicubic</li> <li>• CA = Bicubic sharper</li> <li>• CO = Bicubic smoother</li> <li>• S3 = Spline36</li> <li>• S6 = Spline64</li> </ul>
<b>%b / %B</b>	Short/long name of the Blender used <ul style="list-style-type: none"> <li>• N = None</li> <li>• L = Linear</li> <li>• M = Multiband</li> <li>• S = Smartblend</li> </ul>
<b>%c / %C</b>	Short/long name of the color correction applied <ul style="list-style-type: none"> <li>• N = None</li> <li>• L = LDR</li> <li>• H = HDR</li> </ul>
<b>%l / %L</b>	Group name as defined in the Layer Editor
<b>%v</b>	Version of Autopano Pro used for rendering
<b>%g</b>	Panorama # (unique global index #)

The following model is used by default: "Pano - %i - %s - %p%t%c - %l" returning the following:

"Pano - DSCN0839 - 1261x512 - SLIN - Blended Layer.psd"

```
Name of the first image: DSCN0839
Render size: 1261x512
SLIN => (S)pherical, (LI)near, (N) no color correction
```

- **Name:** this area of the dialog displays a translation of the naming syntax model used, allowing you to preview the final filename. It also displays real time information regarding possible naming conflicts: does this name already exist? We wouldn't want to overwrite an existing file.

Note: a panorama can generate several files if you created some layers using the Layer Editor. They will all be listed here. In the same way, if one of the file to be rendered contains embedded layers a small crosshair will appear next to its name. You can click on this crosshair; a list of all the layers that will be created during the rendering process will then be displayed.

- **Overwrite existing files:** this option allow you to force file overwrite.
- **Add an ending number in filename to prevent overwrite:** this option will automatically modify the filename by adding a trailing series of numbers to the filename in order to avoid conflicts.

## 6.8 Validation

- **Render:** apply the chosen parameters, launch the rendering and close the dialog.
- **Apply:** apply the chosen parameters, close the dialog, but does not launch the rendering.
- **Cancel:** cancel all changes and close the dialog.

## 6.9 About our Rendering Engine

### 6.9.1 Cell-Rendering

During the rendering operation, as you may have noticed, everything is performed on small cells; this is a technique called "cell-rendering". The whole workload to be performed on the panorama is divided in a set of small jobs, taking in charge small portions of the final image. This model is a lot harder to develop but presents huge advantages:

- Immediate support for multi-core / multi-processors systems: each computing unit manages a cell (in the future, this same approach will be used to easily perform network rendering and split the work load across multiple computers on a network).
- The amount of RAM required is lower: this is a logical consequence as we reduce the amount of work to be performed to a small cell, we then need less resources to process it (the number of source images used in a cell is often reduced to a maximum of 3 or 4 images, even if the panorama is composed of a 100 source images).

### 6.9.2 VFW, virtual file writer

This exclusive technology combined with cell-rendering allows us to even further reduce the resources needed to generate very large panoramas. You will be able to generate panoramas from a large number of source images even if your computer does not have a lot of RAM.

For example, if you perform a rendering from jpeg source images using Multiband as blender and writing to a PSD file, the Virtual File Writer will generate the panorama without the need to create a temporary file or using a lot of RAM. Everything is perfectly optimized for this mode to be as efficient as possible, even with panoramas of several gigapixels.

# 7 Batch Rendering

## 7.1 Concept

## 7.2 Contents

- 1 Concept
- 2 Interface Description
- 3 The Toolbar
- 4 Rendering Queue and Properties

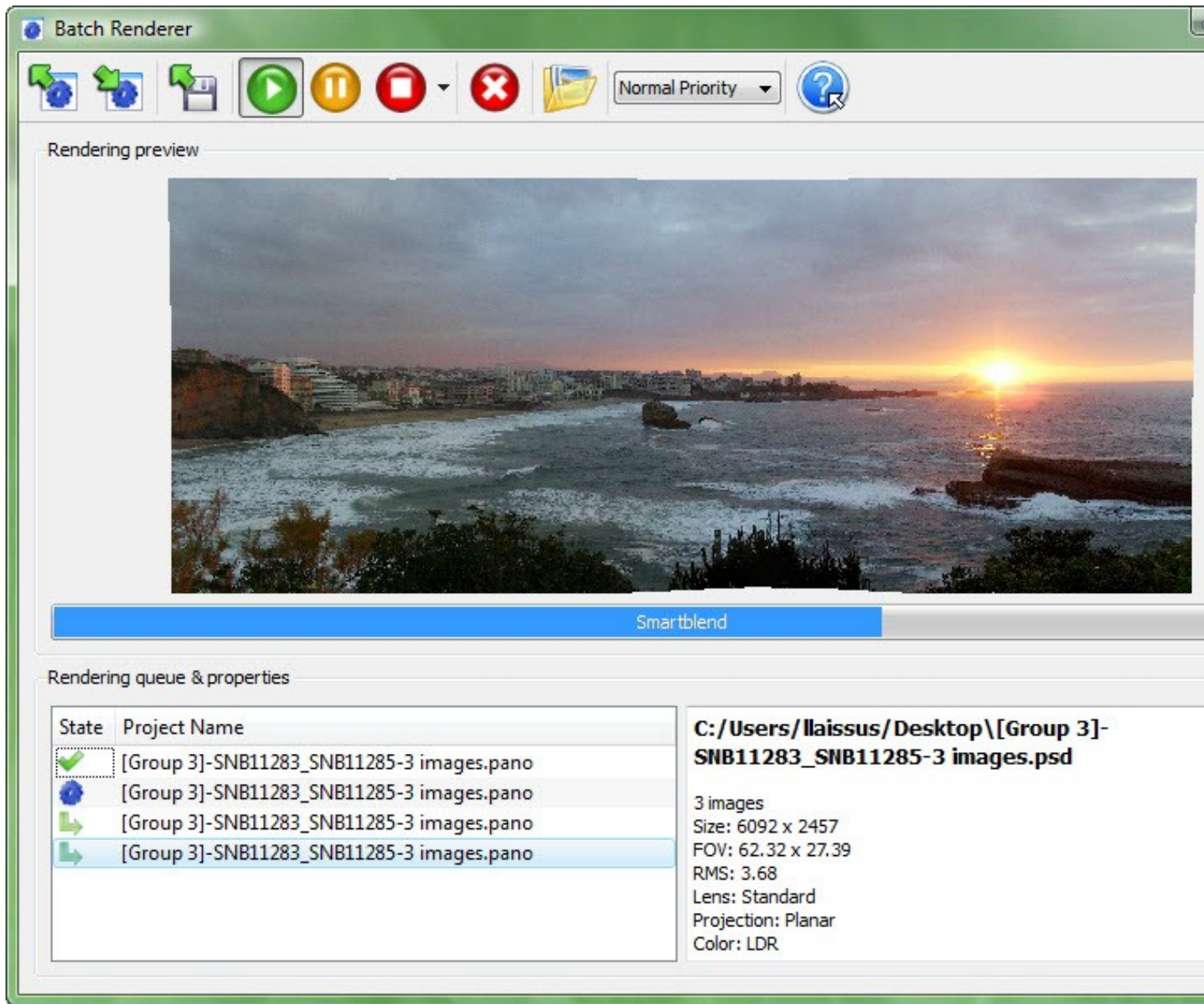
The Batch Rendering feature is designed to automatically process a queue of panoramas rendering tasks. All you need to do is define a list of project files (.pano) you want to render. Each project will be rendered once the previous rendering task is completed.

Note: Even though Autopano Pro allow you to continue working (panorama detection/editing) while a panorama is being rendered in the background, it is sometimes a better idea to defer the final rendering and perform it at a time when you do not need to use your computer (at night for example), especially if you need to render a very large panoramas.

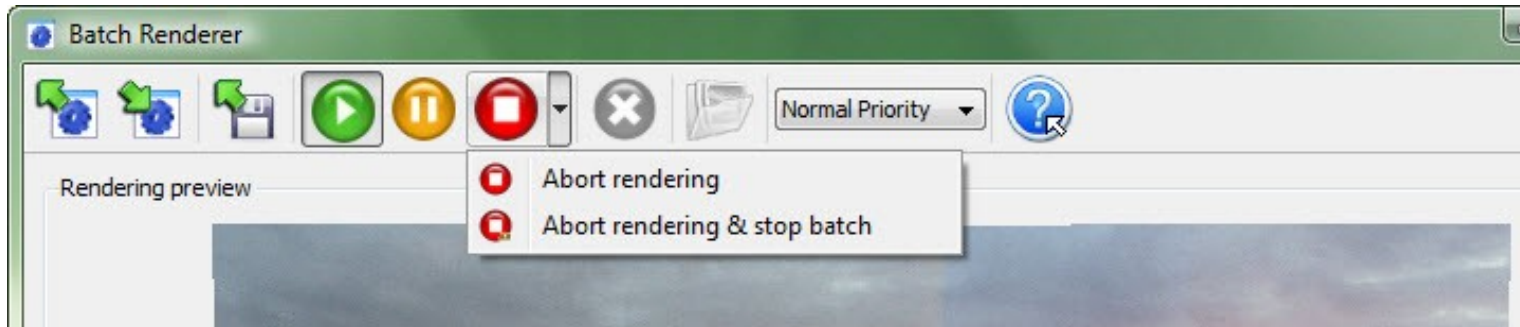
## 7.3 Interface Description




The interface is divided in three major areas.







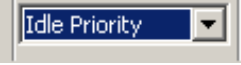
- **The Toolbar:** with buttons to launch, pause and stop the batch rendering,
- **Rendering Preview:** displays a real time preview of the rendering process
- **Rendering queue & properties:**



## 7.4 The Toolbar



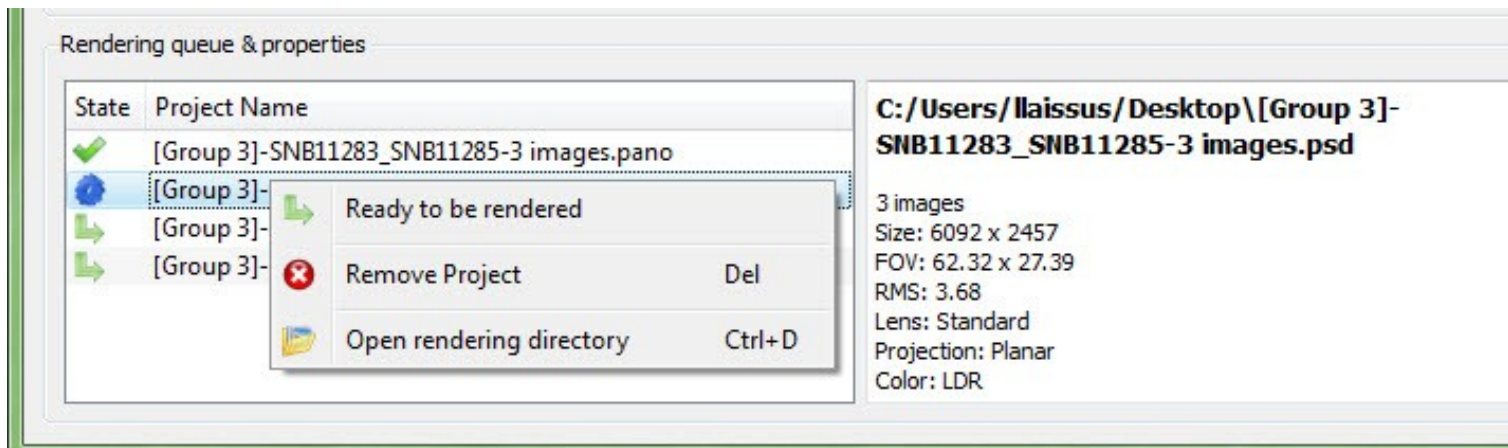
-  **Open the rendering list:** open an (.apb) file containing a list of projects to be rendered.
-  **Save rendering list:** save an (.apb) file containing the list of the projects currently in the rendering queue.
-  **Add a project:** add one or several projects to the rendering queue.

- 
**Start/Stop the batch renderer:** start or stop the processing of the rendering queue. Only the projects flagged ?Ready to be rendered? in the queue will be rendered. This means that a rendered, canceled or failed project will no be rendered. To stop the batch renderer without canceling the rendering currently in progress, click again on Start.
- 
**Pause the batch rendering:** pause the rendering process in progress.
- 
**Cancel the current rendering:** cancel the rendering of the current project and start the rendering of the next project. The batch renderer itself is not stopped.
- 
**Cancel the current rendering and & stop the batch renderer :** cancel the rendering in progress and suspend the processing of the rendering queue.
- 
**Remove one or several projects from the list:** remove the selected projects from the list. A project currently being rendered cannot be removed from the list.
- 
**Open the destination folder:** provide easy access to the various projects destinations folders.
- 
**Process priority:** a rendering set to maximum priority will use the full available processing load of the computer (rendering is then faster); this will affect the performances of all the other programs currently running on your system. In the other hand, a rendering set to **no priority** will share its computing needs with the other programs needs (rendering will then take longer), you can continue using the computer for other tasks.



The last icon allow you to display some help content for each button. Click on this icon then click on the icon you need help with.

## 7.5 Rendering Queue and Properties









State	Project Name
✓	[Group 3]-SNB11283_SNB11285-3 images.pano
⚙	[Group 3]-
➡	[Group 3]-
➡	[Group 3]-

**C:/Users/llaissus/Desktop/[Group 3]-SNB11283\_SNB11285-3 images.psd**

3 images  
 Size: 6092 x 2457  
 FOV: 62.32 x 27.39  
 RMS: 3.68  
 Lens: Standard  
 Projection: Planar  
 Color: LDR

This area display a list of the projects selected for rendering. You can display a project?s properties by selecting a project; its properties (filename, file format etc.) will then be displayed in the area located to the right.








The icon displayed in front of a project name gives you information about the state of the project:

-  : the project was successfully rendered.
-  : the project is currently being rendered.
-  : the project is waiting to be rendered.
-  : an error was encountered while rendering the project.
-  : the rendering of the project was canceled.
-  : the rendering of the project was paused.






The contextual menu **Ready to be rendered** will reset the current state of the project to **Waiting for rendering**. This will allow you to render a project a second time without having to remove it and add it again to the queue.

# 8 Icons and Shortcuts








## 8.1 Sorting Source Images

-   **Ctrl+B**  
**Cmd+B** Scan a folder containing source images from several panoramas shooting sessions
-  Select the source images to be analyzed
-  Add source images to a group
-  Open the Image Properties dialog
-   **Ctrl+N**  
**Cmd+N** Create an empty group





## 8.2 Lanuching Panorama Detection

-   **F2** Launch the panorama detection process in all groups / Stop all detections in progress
-   Start / Stop panorama detection for a group
-  Set the group detection settings in order to tune the detection quality for that particular group




## 8.3 Project Files Management

-  Save the Autopano project file
-   **Alt+S**  
**Option+S** Save all project files for all currently open panoramas
-   **Ctrl+O**  
**Cmd+O** Open an Autopano Pro project file (.pano)
-  Export the project to PTgui, PTassembler or Hugin
-  Import a PTgui, PTassembler or Hugin project

## 8.4 Workspace Management Files (Only available in Autopano Giga)

-   **Ctrl+Maj+W**  
**Cmd+Maj+W** Load a workspace file (.apw)
-   **Ctrl+O**  
**Cmd+O** Save a workspace (.apw)

## 8.5 GUI Layout Management

-   **Alt+G**  
**Option+G** Close all groups
-  Close all currently opened panoramas. You will be prompted to save or discard any unsaved panorama.





 **Ctrl+1**  
 **Cmd+1**  
 **Ctrl+2**  
 **Cmd+2**  
 **Ctrl+3**  
 **Cmd+3**



Split the Main Window into two equal panels: the left panel displaying the groups, the right panel displaying the panorama previews.

Display only the Groups View (hide the Panoramas View)

Display only the Panoramas View (hide the Groups View)

## 8.6 Render Management



 **Alt+R**  
 **Option+R**  
 **Ctrl+R**  
 **Cmd+R**

Launch the rendering task for a panorama

Launch the rendering task for a panorama bypassing the Render Settings dialog

Launch rendering tasks for all currently opened panoramas

Launch the rendering task for all currently opened panoramas bypassing the Render Settings dialog

Show / Hide the **Batch Rendering** window

## 8.7 Panorama Editing

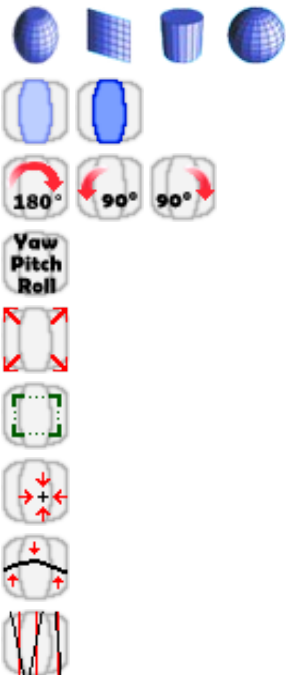


Launch the Panorama Editor, offering the following editing tools:

Activate / deactivate the Control Points Editor

Show / Hide de History window

## 8.8 Geometry Editing



Change the projection mode Mercator, Planar, Cylindrical or Spherical

Activate the Layers Mode allowing you to visualize individual source images within the panorama

Rotate the panorama 180°, 90° clockwise and 90° counterclockwise

Numerical transformation

Display all the pixels of the panorama













Crop tool, to keep only a selected area of the panorama

Set Center Point: Used to set the panorama's viewpoint










Automatic Horizon: used to automatically adjust the panorama's geometry

Set Verticals: used to straighten the panorama using lines

## 8.9 Color Correction

	No Color / Exposure correction
	Apply a LDR color correction (also called standard correction)
	Apply a HDR color correction
	Display the color correction anchors for advanced color corrections
	<i>Locked</i> anchor type
	<i>Transfer Function</i> anchor type
	<i>White Balance</i> anchor type
	<i>Transfer Function + White Balance</i> anchor type
	<i>Mono Transfer Function</i> anchor type
	<i>Mono White Balance</i> anchor type
	<i>Mono Transfer Function + White Balance</i> anchor type
	Levels / Histogram

## 8.10 Control Points Editor

	Views On / Off
	Portrait / Landscape layout
	Views synchronization
	Optimize the panorama
	Add Control Points inside the selected areas
	Removed the selected control points
	Add control points/links using Geometry Analysis
	Removes bad control points using a tunable algorithm
	Control Points Editor Settings

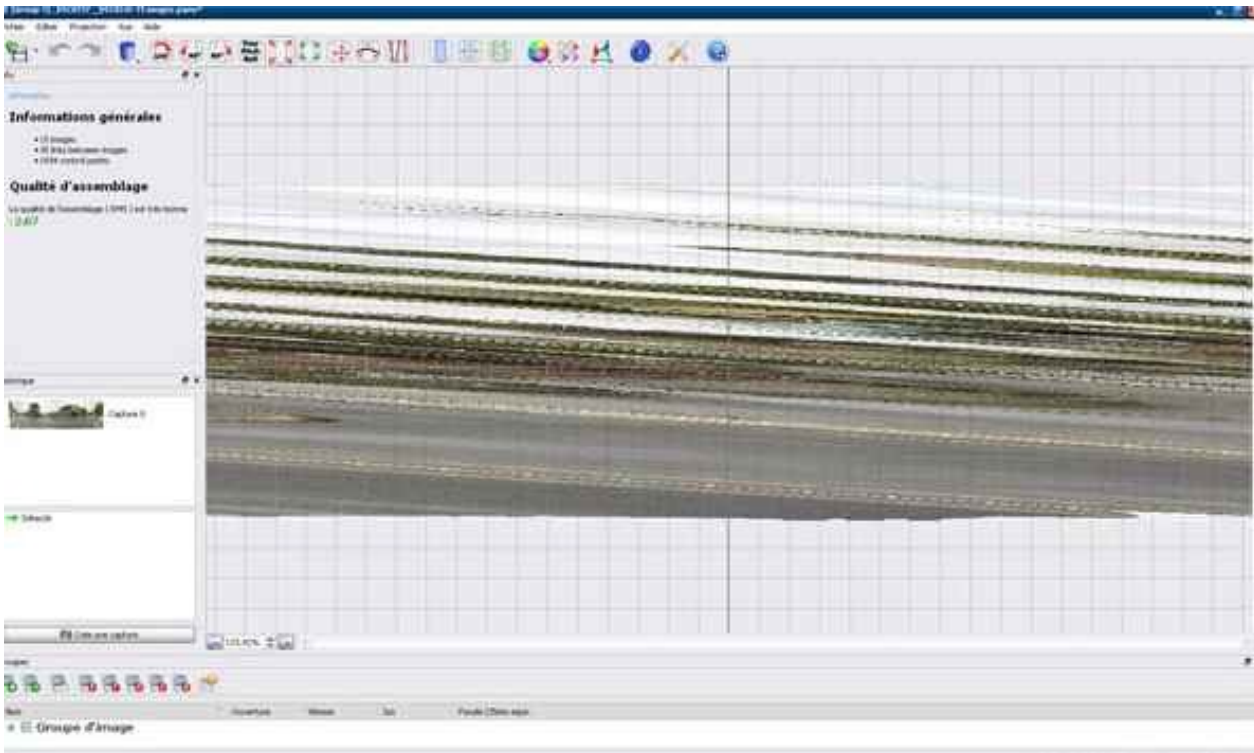
# 9 Troubleshooting

## 9.1 Contents

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  - ◆ 1.7 The Preference menu is inaccessible (grayed out) ( Mac Version )

## 9.2 AUTOPANO PRO 2 AND AUTOPANO GIGA 2

### 9.2.1 The preview looks like this



If when opening the Panorama Editor you find yourself with a panorama preview resembling the example the problem is related to your graphic's card driver. Please update your graphic's card driver to the latest version. The procedure is quite simple but differs depending on the make and model of your computer.

- For notebook computers the drivers are only available from the computer's manufacturer website: Dell, HP, Asus, Sony, etc.
- For a desktop computer the drivers can be found on the website of the graphic card's manufacturer:
  - ◆ nVidia: <http://www.nvidia.com/Download/index.aspx?lang=en>
  - ◆ ATI: <http://support.amd.com/us/gpudownload/Pages/index.aspx>

Note: On some notebook computers the graphic drivers supplied by the manufacturer himself can have problems. Example: ASUS driver (nv18585\_Vista64) contains some bugs preventing Autopano to work properly.

### 9.2.2 Display Stability ( Mac Version )

At the present time it so happens that the Leopard version of Autopano using Cocoa is a touch less stable than the Tiger version using Carbon. This comes from the fact that we are using the QT library for the UI framework. This library has been ported to Cocoa only quite recently. Until we address the problem, you can, as a workaround, if you are experiencing issues, use the Tiger version (can be used under Leopard without any problem). You will lose the advantage of working in 64bits as only Cocoa supports it.

### 9.2.3 Installation Issue ( Mac Version )

The GPU mode can present issues on MACs. In order to fix the problem, a simple update will not fix the issue, what you need to do is a combo update. What this means is that you need to download a full system update from the Apple website and install it manually. You need to this as the automated updates do not automatically patch all system components and in particular those related to GPU issues.

[http://www.apple.com/downloads/macosx/apple/macosx\\_updates/macosx1056comboupdate.html](http://www.apple.com/downloads/macosx/apple/macosx_updates/macosx1056comboupdate.html)

Other issue: If Autopano Pro 2 or Autopano Giga hangs at start up and your are using Growl, make sure you have the latest Growl version here: <http://growl.info/>

### 9.2.4 Crash during rendering

This is a common issue, generally caused by a "not enough memory" error. Autopano can stitch very large panoramas, but in order to do so you need to check on some of its settings before producing gigapixels panoramas:

- But first of all: the computer. It will of course not be possible to stitch large panoramas using a shabby computer. In order to do large panoramas you need a computer with at least 2Gb of RAM and a large amount of free hard drive space for the temporary files (20GO is a good starting point).

For extremely large panoramas (more than 500 source images) a 64bits computer with a 64bits OS will become necessary.

- Global Setting: in the Edit menu, Settings; check the following parameters:
  - ◆ Do not use a large value for the Cache (20 MB at most).
  - ◆ Choose the **Low** setting for the Memory used during rendering option.
  - ◆ Close and restart Autopano Pro for the changes to take effect.
- Check the power saving settings on your computer :
  - ◆ you should never left the harddrive go to sleep during rendering. This is a common cause of crash during this stage.

Once this is done you should be able to render very large panoramas without crashes.

Note: As far as the Autopano Pro rendering engine is concerned only width matter. In other words height does not affect our cell rendering engine. Therefore, if your panorama is 10000 x 40000 pixels, it's relatively small for the engine. In the other hand, if it is 40000 x 10000 pixels it is quite big!

### 9.2.5 My registration information aren't saved ( Mac Version )

It's a know bug on the Mac version.

- First make sure you have the latest Autopano version installed.

You can obtain it here: <http://www.autopano.net/en/buy-autopano/updates.html>.

- Next, if that still does not solve your problem, you need to delete the Autopano preference files so then can be generated again next time Autopano starts.
  - ◆ Under Tiger: use spotlight to find the file named **com.kolor.Autopano.plist** and/or the **com.kolor.AutopanoPro.plist**. file then delete it/them.
  - ◆ Under Leopard: Use the finder and navigate to the ~/Library/Preferences/ folder. Inside this folder delete all files beginning with .com.kolor

### 9.2.6 Temporary files are not deleted when closing groups or panoramas

That's not a problem it's just the way Autopano works. The temporary files are often processed RAW files. We assume that if the software remains open you may want to reuse the developed RAW files and that's why they are kept intact. The image can be used in a group, a panorama or in the rendering queue, etc? . All other temporary files are released as soon as they do not serve any purpose anymore: for example, once the rendering process is completed the temporary space used for rendering is cleaned up.

### 9.2.7 The Preference menu is inaccessible (grayed out) ( Mac Version )

First check that no dialog such as "Settings", "Batch Render" or "About" is open. Otherwise use spotlight to find the file named **com.kolor.Autopano.plist** and/or the **com.kolor.AutopanoPro.plist**. file then delete it/them.