



Redditch
Photographic
Society
Founded 1948

Scaling and Constraining Projected Digital Images

1. BACKGROUND

Redditch Photographic Society uses a high-quality digital projector for its presentations and competitions, the maximum resolution of which is 1920 wide by 1200 high. This projector works in conjunction with the Society's laptop which can drive the projector at this resolution whilst displaying images on its screen for the purposes of controlling the presentation or competition. Unfortunately, when connected to our projector, the laptop is not capable of displaying images on its screen with resolutions set to a maximum of 1600 x 1200 pixels, as employed until the end of the 2017/18 season, hence the change to the new resolution for the 2018/19.

One further benefit of this change is that landscape images 1920 pixels wide and no more than 1200 pixels high will now be displayed to the full width of the projected area whereas at the previous resolution, images only partially filled projected area. Thus, such images will be larger and shown to better effect at the maximum resolution which the system is capable of delivering.

It is acknowledged that the whole subject of image scaling and constraining is potentially confusing, and it is the objective of this annex to allay this through providing appropriate guidance.

2. SCALING AND CONSTRAINING PDI IMAGES

The maximum specified resolution required for projection is 1920 x 1200 pixels.

Key Point 1: It is a fundamental principle that images for projection do not have to be exactly 1920 pixels wide by 1200 pixels high, but merely constrained within these dimensions.

The 1920 x 1200 pixels specification represents a width to height ratio of 16:10 or 1.6:1. This is known as the ASPECT RATIO of the image.

Key Point 2: The photographer must set the Aspect Ratio based upon the aesthetics of the image and let that dictate how the image is constrained.

The following examples will hopefully clarify this process.

Example 1 'Letterbox' Landscape Shot

You take a landscape shot with your 24 Megapixel DSLR. Out of the camera, this image is 6000 x 4000 pixels which relates to an Aspect Ratio of 3:2 or 1.5:1.

For aesthetic and pictorial reasons in photo editing software you decide to crop away a large proportion of the sky and produce a 'letter box'-style panoramic image. The resulting image remains 6000 pixels wide but is now 2500 pixels high i.e. 6000 x 2500 with an Aspect Ratio of

12:5 or 2.4:1. However, as either width or height exceed the 1920 x 1200 pixel limits - in this case both exceed the limits - then scaling is necessary.

If you now *scale down* the image to fit within the constraining resolution of 1920 x 1200 *whilst maintaining the same aspect ratio of 12:5*, being a 'letterbox' the image is constrained by its width to 1920 pixels, but the height is reduced to 800 pixels.

The resulting image therefore is 1920 x 800 which still has the same aspect ratio of 12:5 or 2.4:1. When projected this image fills the full width of the screen, but not the full height: this is fine, and the image will be displayed to best advantage to the aspect ratio intended by the author.

Example 2 Portrait Shot

You take a portrait shot with your 24 Megapixel DSLR. Out of the camera, this image is 4000 x 6000 pixels which relates to an Aspect Ratio of 2:3 or 0.666:1.

For aesthetic and pictorial reasons in photo editing software you decide crop away a small amount of background above the subject's head whilst retaining the image in a general portrait format. The resulting image remains 4000 pixels wide but is now 5000 pixels high i.e. 4000 x 5000 with an Aspect Ratio of 4:5 or 0.8:1. However as either width or height exceed the 1920 x 1200 pixel limits - in this case, as with example 1, both exceed the limits - then scaling is necessary.

If you now *scale down* the image to fit within the constraining resolution of 1920 x 1200 *whilst maintaining the same aspect ratio of 4:5*, being in portrait format the image is constrained by its height to 1200 pixels, but the width is reduced to 960 pixels.

The resulting image therefore is 960 wide x 1200 high which still has the same aspect ratio of 4:5 or 0.8:1. When projected, this image fills the full height of the screen, but not the full width: this is fine, and once again, the image will be displayed to best advantage to the aspect ratio intended by the author.

The two examples above may not be too easy to follow. But, once the methods scaling and constraining described below are mastered, it might be worth attempting to duplicate these scenarios as a means of becoming familiar with the scaling process.

3. HOW TO SCALE AND CONSTRAIN PDI IMAGES

The exact method of scaling and constraining images varies depending upon which software package is employed. However, the principles are often similar and so even if the package employed is not covered below, similar processes should be capable of being worked through using the help usually provided. Some packages also have multiple ways of achieving the same outcome so not all options are considered below.

Note that for all types of software, scaling and constraining of images should be a 'last act' following the completion of all other editing of the image's aesthetics etc. It is also recommended that copies of the edited file should be retained *prior* to scaling as in doing so,

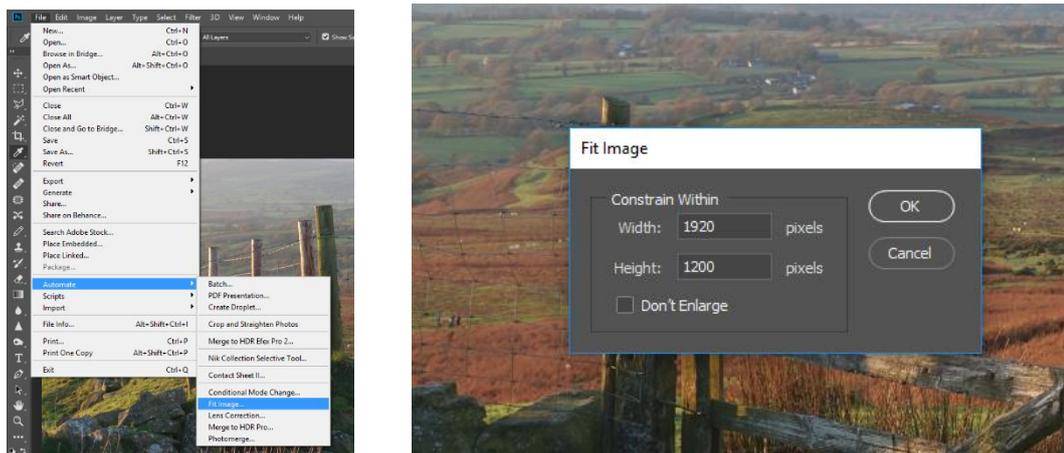
resolution and hence detail - highly desirable for other purposes, such as producing a print of the same image - will be irrecoverably lost.

PhotoShop CC: The Easiest Way

PhotoShop CC provides one of the easiest and fool-proof methods of scaling/constraining an image using an automated procedure, as follows.

- I. With the image open, go to File.... Automate.... Fit Image.
- II. Beneath “Constrain within” enter 1920 in the Width box and 1200 in the Height box.
- III. Press OK or hit Enter.

The image should shrink on screen to show that the process has been completed.



The new size can be confirmed by going to Image... Image Size where the width and height should be shown with neither greater than 1920 and 1200 pixels respectively.

PhotoShop CC: Traditional Way

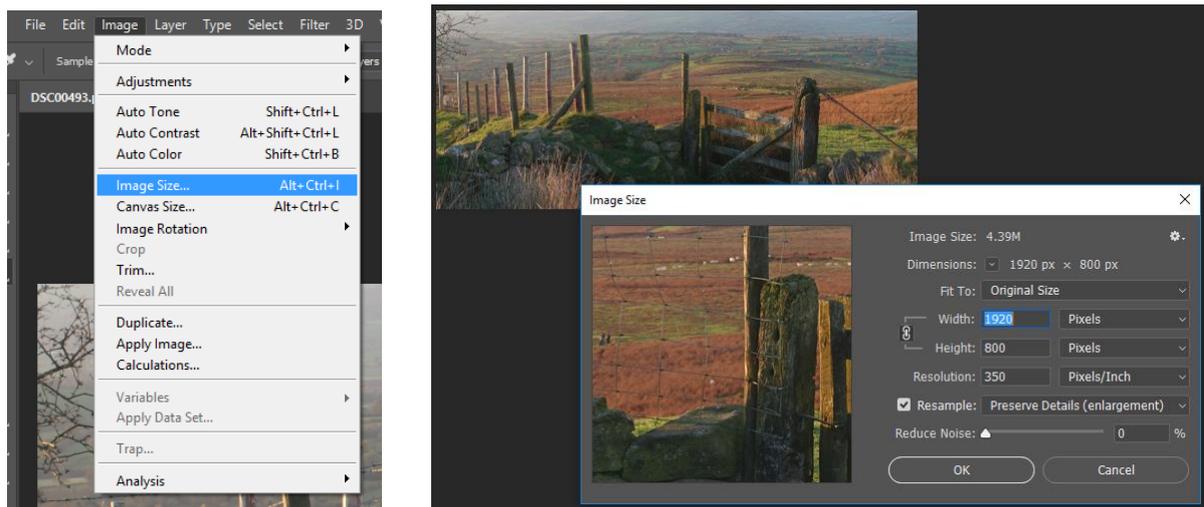
This method is straightforward yet requires a little more thought.

NB Many other photo editing packages with have a scaling method similar to this.

- I. With the image open, go to Image... Image Size
- II. Ensure the little ‘chain’ symbol is clicked such that bars lead to both Width and Height values: this is critical to maintain the aspect ratio of the image.
- III. For a Landscape orientation image enter 1920 in the Width box. If the Height box then shows a value of 1200 or less this step is complete so head to step V, otherwise go on to step IV.
- IV. For a Portrait orientation image enter 1200 in the Height box. If the Width box then shows a value of 1920 or less this step is complete so head to step V, otherwise go back to step III.
- V. Press OK or hit Enter.

The image should shrink on screen to show the process has been completed.

The new size can be confirmed as the width and height should be shown with neither greater than 1920 and 1200 pixels respectively.

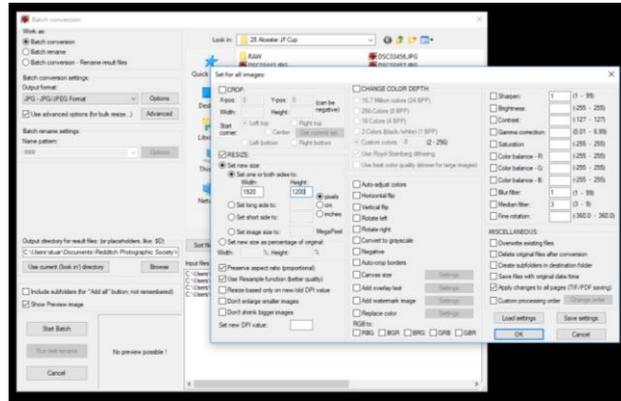
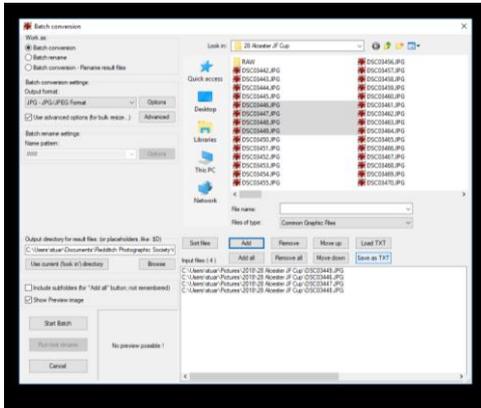


IrfanView

IrfanView is a very useful piece of image viewing shareware and is available from www.irfanview.com free of charge. It does not have all the editing functions of other packages, but for basic adjustments such as viewing, cropping and, file sizing/renaming, it is valuable and generally intuitive tool.

The method described here is a 'batch' process, namely one applied once to one or a number of images. As such, it could be applied to a number of PDIs post-editing as a late-stage task in your workflow for producing PDIs:

- I. Press 'B' on the keyboard: this opens the Batch conversion window.
- II. In the "Work as" box press the Batch conversion radio button.
- III. In the "Look in" drop down menu, select the folder in which your images to be scaled are saved.
- IV. Select the images to be converted and press the 'Add' button: this adds the files to the list of Input files.
- V. Under 'Output directory' click on the Browse button and select the output folder. It's best that this differs from the input folder as this prevents the source files being overwritten. If the same folder must be used then select Batch conversion – rename result files at step II.
- VI. Under Batch conversion settings, select Advanced Button: this opens a further dialog box.
- VII. Tick RESIZE tick box, if not ticked already.
- VIII. Set width to 1920 and Height to 1200 pixels.
- IX. Ensure that Preserve aspect ratio (proportional) is ticked. NB there are many more options for additional operations which may also be implemented as part of the batch process. However, if just scaling the images, ensure all other options are unticked.
- X. Press OK or hit Enter to start the batch conversion process. The scaled images are now saved in the specified output folder.



GIMP

GIMP is a free and open source image editor with many of the features found in other software such as PhotoShop and may be sourced from www.gimp.org. More advanced features such as Layers are also included, making it a very useful gateway into the topic.

The method described has close parallels to the “PhotoShop CC: Traditional Way” described above:

- I. From the menu bar, select File... Open.... In the dialog box navigate to find the file you wish to convert, pressing Open to open the file.
- II. From the menu bar, select Image.... Scale Image to open the Scale Image dialog box.
- III. Ensure the little ‘chain’ symbol is clicked such that bars lead to both Width and Height values: this is critical to maintain the aspect ratio of the image.
- IV. For a Landscape orientation image enter 1920 in the Width box. If the Height box then shows a value of 1200 or less the process is complete so head to step V, otherwise go on to step IV.
- V. For a Portrait orientation image enter 1200 in the Height box. If the Width box then shows a value of 1920 or less the process is complete so head to step V, otherwise go back to step III.
- VI. Press Scale or hit Enter.

The image should shrink on screen to show the process has been completed.

The new size can be confirmed as the width and height should be shown with neither greater than 1920 and 1200 pixels respectively.

4. FREQUENTLY ASKED QUESTIONS

Q1 I have a PDI file which I scaled to fit within 1600 x 1200 pixels in accordance with last season's requirements. Can I use it in this season's competitions?

A1 If the image is 1200 high then it should display to the full height of the projected area. However, if neither width nor height are at the maximum allowed - i.e. 1920 x 1200 – then, although the image will be accepted for the competition, it will not be displayed as large as others constrained to 1920 x 1200 and therefore it may have a reduction in impact. The image could be scaled-up to meet the 1920 x 1200 constraints, but this is not recommended as artefacts associated with interpolation between existing pixels may become apparent. Better is to find the original edited image prior to scaling and apply size constraints to that.

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