Digital Photograph Post-Processing Workflow (in Photoshop)

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Latest version available at:
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Introduction

In this tutorial, I have compiled technical tips from two reference books: *Digital Exposure Handbook* by Ross Hoddinott and *Architectural Photography* by Adrian Schulz.

This example Workflow is biased towards applications for architectural and interior photography. It's mostly reusable for general photograph enhancement, but it covers subjects such as perspective corrections, but not skin tone optimisation for example.

Before you start: Calibrate your Monitor using Adobe Gamma

- Utility installed alongside Photoshop on Windows PC.

- *My Computer* > *Control Panel* > *Adobe Gamma* and follow the on-screen instructions.

I) Why work in RAW format rather than jpeg?

- RAW encodes all pixels whereas jpeg compresses data by comparing pixels to their neighbours. This may create artefacts when said pixels are modified in post-processing.
- Jpeg has a color depth of 8 bits per color channel, therefore 256 levels can be encoded. RAW uses 12 or 14 bits per color channel, allowing 4096 or 16 384 shades respectively.

II) RAW Conversion (using Adobe Camera Raw ACR Converter)

1) **Adjust the *White Balance*** using one of these 2 methods:

- Manual WB using the *Temperature* and *Tint* sliders: adjust the colour temperature of the image using the *Temperature* slider, then do small adjustments with the *Tint* slider.

- Semi-automated WB with the WB tool: more precise, on the condition that you can identify a patch of the image corresponding to neutral grey in the real world. Select it with the eyedropper tool.

2) Histogram

- activate Shadow and Highlight clipping warning. Clipped highlights are marked in red, clipped shadows in blue.

3) ***Basic* Panel**

- Slide *Contrast* a little to the left and adjust shadows and highlights individually using the *Recovery* and *Fill Light* sliders. The contrast is now reduced to avoid clipping in subsequent more elaborate steps of the post-processing.

- The *Clarity* setting increases the local contrast of the image but tends to create halos around contrast-rich edges so must be used with caution.

- *Vibrance* and *Saturation* should be left in neutral position as these settings are better adjusted in later steps.

4) ***Tone Curve* Panel**

- Adjusting the tone curve determines the brightness in the image.

- *Point* method allows to manipulate the curve directly.

- *Parametric* method adjusts the curve with 4 sliders controlling *Highlights*, *Lights*, *Darks*, *Shadows*.

- Manipulating the curve into a 'S' shape adds contrast to the midtones. Manipulating the curve into an inverted 'S' shape reduces contrast in the midtones.

5) *Details* Panel

- Perform only minor sharpening if any. Sharpening should be one of the very last steps of the workflow otherwise it may create artefacts.

- Set *Amount* between 10 and 20.

- Set *Radius* no higher than 1.

- Set *Detail* between 5 and 15.

- Leave *Masking* at a low setting.

- A slight reduction of Colour Noise should be done using the slider. More elaborate noise reduction will be done later in photoshop because photoshop can identify the type of noise, and therefore does more efficient noise reduction.

6) ***HSL/Greyscale* Panel**

- HSL = Hue, Saturation, Luminance

- *Hue*: small corrections within selected colours (for example correct the sky for the redness typical of digital images).

- *Saturation*: at this early stage, only use it for small intensity corrections needed as a side effect of earlier manipulations. For example, while bright areas manually darkened and dark areas manually lightened seem to have more intense colours, the darkening of already dark areas and the brightening of already bright areas result in loss of colour intensity that may require correction.

- *Luminance* allow to adjust the brightness of selected colours.

- Checking the box *Convert to grayscale* converts the image to B&W. Grey values can be set for each colour individually using the sliders, in order to create unusual B&W images.

7) ***Split Toning* Panel**

- Allows individual adjustments of colours for bright and dark areas. Useful when areas in the shadows show up tinted while other areas show the correct colour.

- Also allows tinting of images previously converted to greyscale (for example, Sepia tinting).

- Those adjustments however are rarely done at this stage.

8) ***Lens Correction* Panel**

- Correct optical aberrations caused by the lens such as colour-fringes, chromatic aberrations and Lens vignetting (fall-off of light toward the corners of an image).

9) Additional Options

- *Spot Removal* tool: useful to remove specks caused by dust on the sensor.

- *Straighten tool*: draw a line through the image to use as a direction for straightening.

- But *Crop* and *Straighten* tools should not be used at this stage if you plan on correcting distortions later in the workflow.

10) Convert the image to RAW

- Select the Colour Space: *sRGB* is best for most Internet and PhotoLab uses, while the larger *Adobe RGB* colour space is best for advanced devices able to show enlarged colour range (some high end monitors and ink jet printers).

- Select a *Depth* of *16 Bits/Channel*, unless the computer is very low in computing power in which case select *8 Bits/Channel*.

- Leave the *Size* setting alone, unless you wish to interpolate the image to a larger format. In that case, do it at this stage while the software is still working with unadulterated raw data to ensure maximum quality.

- *Resolution* may be left alone, it does not affect the number of pixels in the image.

- Set the *Sharpen for* setting to *None*.

- Uncheck the box *Open in Photoshop as Smart Object*.

III) Image Correction in Photoshop

This is to fine-tune or do more elaborate corrections that what we did in the RAW converter.

1) Simultaneous distortion and perspective correction

-Changes to framing or correction of converging verticals should be done simultaneously or after the correction of lens-induced distortions, never before, because distortion correction is only precise if the entire image is processed.!

- *Filter > Distort > Lens Correction*: allows to simultaneously correct barrel distortion from the lens and correct converging verticals. Crooked lines stand out more once perspective is corrected, so it makes sense to make both corrections at the same time.

- *Remove Distortion* slider corrects barrel distortion from the lens.

- *Vertical Perspective* slider in the *Transform* areas corrects converging verticals.

- the *Straighten* tool allows to draw a virtual line through the image, then the software reorients the image parallel to the line: Select the tape measure tool (it shares space with the eyedropper in Photoshop's toolbox) and drag a line across part of your image that should be straight horizontal or vertical. Then choose Image > Rotate Canvas > Arbitrary. Photoshop auto-calculates the value required to straighten your image. Click OK and your image is all squared up.

2) Perspective correction using the *Transform* command

- for distortion-free images, or images after distortion corrections

- turn the *Grid* on or draw guide rulers (*View* menu)

- double click on the background layer thumbnail to make it editable (click OK in resulting dialog box)

- *Edit > Transform > Perspective* or *Distort* : the perspective of the image may now be distorted.

- If you move the upper corners outward, you need to move the lower corners inward otherwise the image will look wrong.

- send the correction layer to the background with *Layer > Flatten Image*.

3) Adjust the image frame

- best to only crop after the perspective has been corrected.

- to crop to a fixed aspect ratio: Select Crop tool and enter the desired ratio in the Width and Heigth (does not need to be the desired dimensions in cm, as long as the ratio is correct such as 3/2) and the crop marquee will be constrained to this ratio.

4) Selective Brightness adjustments: Selective Darkening

- for example, to darken the sky

- *Layer > Duplicate Layer* to duplicate the background layer and make adjustments in it. Alternatively, create an adjustment layer (*Layer >New adjustment Layer > Levels* or *Curves*)

- **3 methods to select the sky:**

1) If there is a clearly defined transition between the sky and the building, use the *Magic Wand Tool* (Holding the *Shift* key allows to expand the selection).

2) If elements such as trees reach into the transition area, another method works better. *Select > Color Range*, click on an area of the sky in the preview box. The selected areas are then marked in white on the image, while the unselected area show up in black. Further areas can be selected with the *Add to Sample* eyedropper. The *Fuzziness* slider should remain on the lower setting. This method always adds areas outside the desired sky that may be corrected later.

- After clicking OK, the selected area show up in the main window.

- *Select > Refine Edge* allows to fine tune the edge. Set *Radius* and *Contrast* by trial and error. Set the *Smooth* and *Feathers* sliders to 0. Set *Contract/Expand* between +5% and +10% to avoid halos around the selected edges.

- Click OK, check that the duplicated layer is active, *Add Layer Mask*. This layer mask gives a different opacity to the top layer, so that entire areas of a layer can be faded out without deleting pixels. The faded out areas can be reconstructed, for example by painting with a white brush within the layer mask.

- Make the Black and white selection layer mask visible by clicking on it while holding the *Alt* key.

3) Select all areas not belonging to the sky with the *Polygonal Lasso tool*.

- after selecting the relevant area with one of the 3 methods above, open *Fill* option from the *Edit* menu. Detailed correction can be done with the brush tool.

- select the layer thumbnail

- Select *Levels* from the *Image > Adjustments* menu.

- In the *Input Levels* histogram, slide only the grey triangle in the middle towards the right to darken only the midtones while preserving the highlights and shadows.

- Alternatively, *Curves* may be used instead of *Levels*.

- Because we are working with a layer mask, the changes only apply to the selected area.

5) Selective Brightness adjustments: Selective Lightening

-Create another layer called 'lighten' (give it a name to avoid confusion when working with at least 2 layers).

- Different methods to make the dark areas of the image brighter:

1) *Select* > *Color Range*, select *Shadows*, apply strong softening to the layer mask.

2) Activate the layer by clicking on the thumbnail. Apply *Levels* or *Curves* as in the previous section. Create a new layer mask. It is white, we want to fill it with black instead: use *Fill* in the *Edit* menu or *Image* > *Adjustments* > *Invert*. Select a large soft brush from the Brush tool, reduce the opacity of the brush to a small value (30%), set the foreground colour to white. Use the brush to paint over the selected dark areas of the layer mask that are too dark. Combine the layer into the background layer (*Layer* > *Flatten* Image).

6) Selective Brightness and Contrast Correction using *Shadows/Highlights*

- *Image* > *Adjustments* > *Shadows/Highlights*. The dialogue box shows sliders for *Shadows* and *Highlights*.

- Click *Show more options*.

- To brighten dark areas: use the *Amount*, *Tonal Width* and *Radius* sliders. *Amount* controls the intensity of the effect and depends on the image but should not be set too high. *Tonal Width* determines which hue of shadows is affected by the process: small values only affect extremely dark areas, while larger values also change brighter areas. *Radius* determines the size of the processed area surrounding the shadows: a too small value causes bright bands or halos, but a too large value causes the effect to work only on large surface areas. The *Midtone Contrast* slider in the *Adjustments* area of the dialogue box can restore the overall contrast if it has been diminished.

7) Selective Brightness and Contrast Correction using a contrast Mask

- To brighten dark areas.

- Duplicate the background layer (*Layer* > *Duplicate Layer*).

- Desaturate the new layer: *Image* > *Adjustments* > *Desaturate*

- Change the layer to a negative image: *Image* > *Adjustments* > *Invert*

- Apply Gaussian blur: *Filter* > *Blur*, set Radius between 5 and 15 pixels depending on the size of the image.

- Set *Blending Mode* to *Overlay* and reduce *Opacity* to a value of 30 to 50%.

8) Selective Brightness and Contrast Correction using *LightMachine* plugin

- *Shadow/Highlight* mode, *Auto mask* window.
- Options for precise correction and avoiding halos.

9) Noise Reduction

- *Filter > Noise > Reduce Noise* if necessary.
- Noise reduction should be done cautiously because it causes loss of details. An image with a small amount of noise often looks better than an image where details have been suppressed by too aggressive noise reduction.

10) Colour correction: Selective Colour Correction/filtering.

- *Image > Adjustments > Selective Color* dialogue box allows precise colour correction.
- Example: 2 methods to cool an image.

1) *New > Layer* from the *Layer* menu, select *Color* as the blending mode. Color the layer blue with *Fill* in the *Edit* menu, reduce the opacity a lot (10%). Use a layer mask to limit the blue tint effect to selected areas of the image only.

2) Alternative method: *Layer > New Adjustment Layer > Photo Filter*. Select a Blue Cooling filter with a density of 10%.

11) Colour correction: Saturation

- *Layer > New Adjustment Layer > Hue/Saturation*

12) Colour correction: Contrast

- *Image > Adjustments > Auto Contrast* stretches the histogram until the darkest parts of the image are pure black and the lighter parts pure white.
- *Image > Levels* allows to manipulate the histogram manually.

13) Colour correction: Selective local Contrast

- Duplicate the background layer.

- *Filter > Sharpen > Unsharp Mask*. Choose a large *Radius* that enhances the contrast along detailed edges, but also the contrast of larger areas of the image as a whole. Fine tune using the *Amount* slider.

- The drawback of this method is to create halos at the transition from contrast rich edges to larger areas. These halos can be corrected with a layer mask and a black paintbrush.

14) Sharpen the image.

2 methods:

1) *Filter > Sharpen > Unsharp Mask* as previously. Select a moderate *Amount* (90%), keep *Radius* between 0.3 and 1.0 depending on the original sharpness of the image, set *Threshold* between 0 and 3. Too high values for *Amount* and *Radius* create ugly artifacts. A too high *Threshold* value reduces the noise caused by sharpening in flat image areas, but also actually reduces the actual sharpening effect.

2) *Smart Sharpen* in later version of photoshop only.

15) Save the image file.

- TIFF or PSD for lossless saving with high color depth. If the image won't be processed further, reduce colour depth to 8 bits (*Image > Mode > 8 Bits/Channel*).

- JPEG with quality of 10 or 11.

Bibliography

[1] Hoddinott, R. (2008) *Digital Exposure Handbook*. Lewes, East Sussex: Photographers' Institute Press.

[2] Schulz, A. (2009) *Architectural Photography: Composition, Capture and Digital Image Processing.* Santa Barbara: Rocky Nook.