Digital Asset Development: Lab Session 2 – Photo Processing Methods

Introduction

This set of exercises will continue some of the themes from this week's lecture class, in the process helping to develop your knowledge of Photoshop's toolset. In addition, we will look at some of the creative tools available in the package.

Before starting the following exercises, you should view the videos on RGB and indexed colour linked on the Moodle page. These provide relevant background information about the different ways in which Photoshop handles different colour models.

Digital Colour Correction

Open up the image *mountains.jpg* (available in the Week 2 section of the Moodle site) in Photoshop. If you prefer, you can try these exercises using an alternative image with similar properties – ideally an outdoor photograph. In this case we have a view over various mountain ridges which tend to fade out into the distance.

Open up the Histogram panel, and expand it to show all channels (to access this feature, click on the dropdown menu icon at the top right of the panel). The red, green and blue channels are shown below – you should notice how the peaks in the blue channel are bunched up to the right end of the graph, reflecting the blue tinge to the image. This profile is characteristic of photos taken outside without professional-level filters.

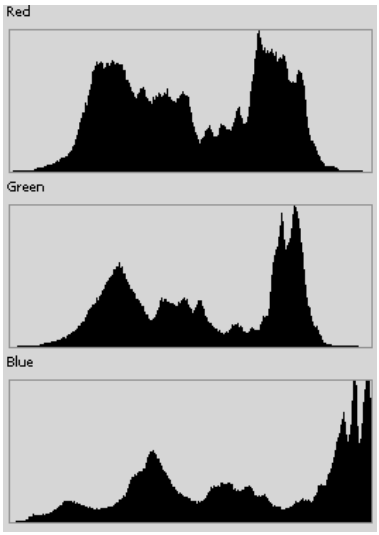

Fig 1: red, green and blue histograms for mountains.jpg

If you switch Channel option for the top graph from RGB to Luminosity, you can get an overall picture of the brightness/contrast profile of the image. In this case, there are empty areas at the left and right extremities of the graph, showing that the overall contrast is on the low side. You can also explore the colour values in the image by moving the cursor around and noting the RGB values in the Info panel. Typically, the

value in the blue channel is around 30-40 higher than the red and green, confirming that the image would benefit from colour correction.

Setting the Black and White Point

We'll first look at how the image contrast can be improved. There are various ways of doing this, most obviously by using Image > Adjustments > Brightness/Contrast. However, this option tends to reduce the overall image quality as some data is lost in the process. As we plan to make more alterations to the colour profile, a safer approach is to use Curves. These allow powerful colour edits to be made with minimal distortion of the colour information in the image.

First, we need to obtain the *black* and *white point*s for the image in order to control the adjustment process. To do this, go to Image > Adjustments > Threshold. This brings up another version of the luminosity histogram, this time with a slider underneath. Drag the slider to the right until only very small patches of white remain in the image. Do not click OK; instead, Shift-click on the image in one of the remaining white areas. This takes a sample of the brightest part (or *white point*) of your photo. Nothing changes in the image, but a marker is placed to indicate the sample point.

Still without clicking OK, drag the slider left until only a few black areas are present. Shift-click in one of these to place a second sample, this time defining the *black point*. Having done this, dismiss the Threshold dialogue by clicking Cancel. If you accidentally click OK at any point you can undo the threshold function using Ctrl-Z as usual. The example below shows likely sample point locations.

Fig 2: sample markers for white point (top right) and black point (lower right)

Having defined our white and black points, we need to use the Curves adjustment to alter the image. In the Layers panel, click on Create Fill/Adjustment Layer (the round icon in the middle of the row at the base of the panel), and choose Curves from the popup menu. This will bring up the Curves controls in the Adjustments panel.

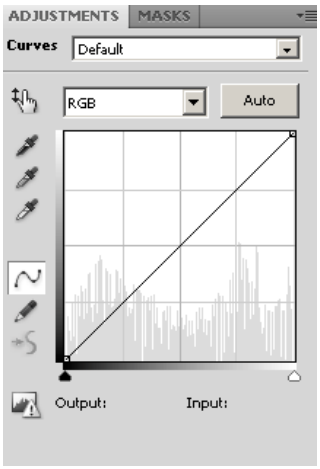

Fig 3: the Curves panel

The Curves panel allows you to define curves that relate the pixel values of a raw photo to those in the processed image without destroying or distorting the original data. Thus it is a very useful and effective editing method. Select the bottom of the three eyedropper icons in the panel and then click on the white point sample marker in the image. Note that you don't have to click exactly on the marker – it is merely there as a guide. You should see the contrast of the photo alter as a result of this. Select the top eyedropper icon and repeat for the black point sample marker.

Your image should now have a much wider range of tones present, giving a more interesting and appealing photograph. If you aren't happy with the outcome, you can always choose a different sample point using the procedure described in the previous paragraph. Notice that the curves panel now has red, green and blue lines showing the relationship between the original and processed colour values in the image. Also, the Info panel now shows you two sets of RGB values as you mouse across the picture – the one before the '/' is the original pixel value, and the one following is the processed output.

You may also adjust the curves in the panel directly by clicking and dragging on them. You can adjust the overall brightness curve (the black line) while in RGB mode, or switch to edit individual colour channels. You should use these edits with care, as it is easy to get carried away. The example below shows some reasonably subtle adjustment of the overall RGB curve. You can add as many points as you like to a curve – they can be removed by selecting them and pressing the delete key.

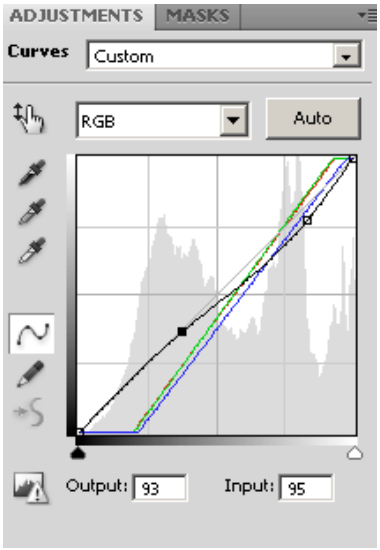

Fig 4: the Curves panel with RGB adjustment

We still have to deal with the overall blue tint that affects the image. To do this we will need a "grey point" sample. Select the Eyedropper tool from the toolbox, hold down the Shift key and click a part of the image with neutral (grey) colour. A good choice is somewhere on the farthest row of hills – atmospheric haze means the picture fades to grey as the viewing distance increases. Your sample data will now appear on the Info panel along with that of the previous markers.

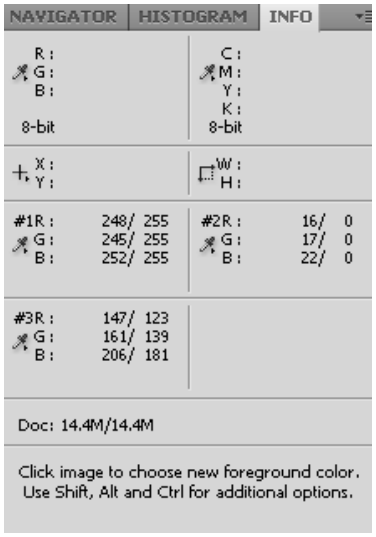

Fig 5: Info panel including marker data

We can selectively adjust the colour by reshaping the channel curves. Our example here (marker 3) has the red channel value a little lower than the green, with the blue much higher than either. In this instance, we can alter the red and blue profiles to match the levels of green in the photo. In the Curves panel, select the blue channel and click somewhere in the middle of the curve. Drag downwards until the output value for

marker 3 in the Info panel is similar to that for the green channel (you can adjust the curve later, so don't worry about being precise). Switch to the red channel, and drag the curve upwards until the red and green values are similar. Your resulting image should have become much more vibrant and colourful as a result, as in the example below. Feel free to tweak the curves for the most appealing result. Use the layer visibility control to flip back and forwards between the original and corrected images.

Fig 6: photo with colour corrections applied

Other Photo Processing Options

Even when you are happy with the image colour profile, there are still aspects of the photo that can be improved. If you zoom in, you'll see there is a fair amount of speckle, common in images captured on a relatively cheap camera. The simplest way to address this is to apply a filter. First, make sure you are on the Background layer of the image rather than the curve adjustment layer. Experiment with the Blur, Blur More, Despeckle and Median filters (found in the Blur and Noise subsections of the Filter menu) to see the effect they have. You may find the best results depend on the portions of the image you are viewing.

Once you have removed the speckle (at least in part), experiment with the Unsharp Mask filter (in the Sharpen submenu). This allows you to sharpen up a blurry image while retaining a high degree of control through the various sliders. You should always be zoomed in to 100% magnification during this process, as it can create unwanted extra detail in the picture if overdone.

Introducing Depth of Field

Sometimes it is useful to be able to process certain parts of an image based on their distance from the camera. For example, we can fake the depth of field imparted by a zoom lens by selectively blurring those parts of a picture that we wish to appear out of focus. The image we have been using is well set up for this purpose, as the hills at different depths can be separated out as shown below. Note that the most distant line of hills is treated as being on the same depth level as the sky.

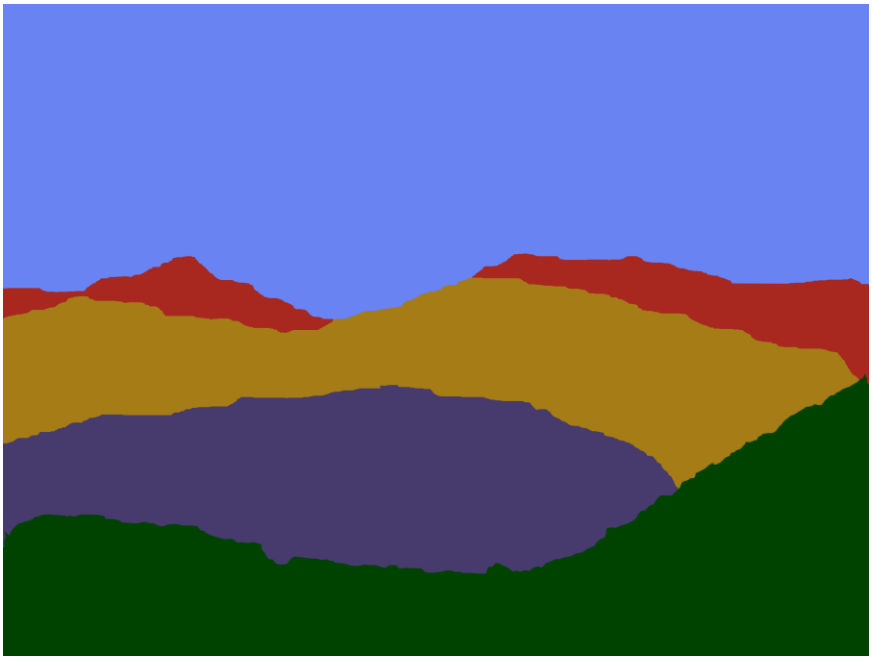

Fig 7: mountain scene split into five depth levels

Using the selection tools discussed last week, copy the part of the photo shown in green above and paste in into a new layer. Repeat for the areas shown in purple, yellow and red, making sure the layers are stacked in the correct order. The visible image should now be split into five separate layers, including the Background layer.

We can apply a blur to each layer individually to make it appear out of focus. The Gaussian Blur filter is good for this as we can control the amount of blurring. Thus, a layer adjacent to the one in focus can appear less blurred than one several layers away from it. Experiment with using this technique to create different depth of field effects.

Further Work

- You have seen how to carry out colour correction on a picture taken outside. Photos captured indoors under artificial lighting usually have the opposite problem, appearing very yellow or orange in tone. Find an example of this type of picture online, and go through a similar set of processes to improve the colour balance, as well as optimising the image contrast.

- Find a red carpet photograph (full length, standing) of any well known celebrity, and use the techniques from last week's lab to add them to the foreground of the processed *mountains* image. You are probably best placing them on the flattish rock at the lower left of the photo. Apply colour correction to the layer with the celebrity so their colour profile matches that of the background.