Summer 2012

Setting Exposure in Photoshop

Introduction

I was helping a customer with editing a photo and I noticed that there must be something wrong with the skin colour, but that I was not quite sure whether there existed a constant way to fix it. Fortunately, a Final Cut Pro tutorial inspired me.

Background

Different material and texture reflects a different amount of light, and that is how we see things. In some fancy studios, they always have light meter to measure skin colour, for they are normally the subject of the shot. Then they can set the exposure in their cameras accordingly. However, owing to budge or some subtle things, there always some overexposed or underexposed photographs.

Zone System

A picture can always be tuned in Photoshop; however, we might want to seek a systematic way to do so. That's when the Zone System comes into help. It is a photographic technique for determining the exposure, developed by Ansel Adams and Fred Archer.

In the system, between pure white and pure black, eleven zones are evenly divided and are assigned number from zero to ten.

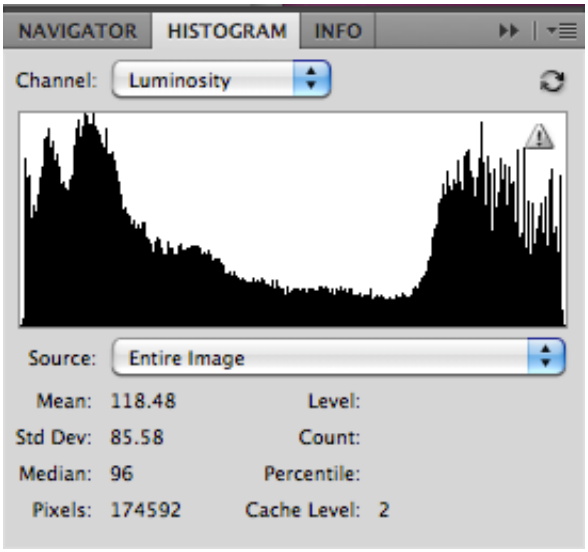
For demonstration purpose, the main focus of this article is the the skin's exposure, for it is often the subject.

0	Pure black
I	Near black, with slight tonality but no texture
II	Textured black; the darkest part of the image in which slight detail is recorded
III	Average dark materials and low values showing adequate texture
IV	Average dark foliage, dark stone, or landscape shadows
V	Middle grey: clear north sky; dark skin, average weathered wood
VI	Average Caucasian skin; light stone; shadows on snow in sunlit landscapes
VII	Very light skin; shadows in snow with acute side lighting
VIII	Lightest tone with texture: textured snow
IX	Slight tone without texture; glaring snow
X	Pure white: light sources and specular reflections

According to the chart, a skin colour normally falls into zone five to zone seven. That's it. That's our guideline.

An underexposed portrait

Histogram



Within Photoshop, this could be shown by choosing Window -> Histogram.

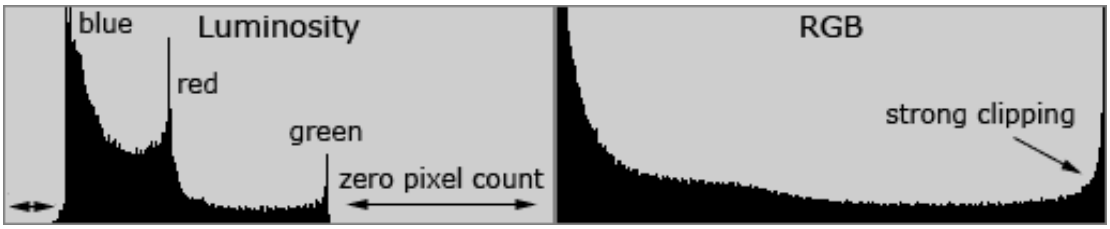
A histogram shows the distribution of pixels in terms of brightness. Pure black on the left and pure white on the right. In the histogram above, it shows that there are a lot of dark areas and bright areas, and clippings on both sides shows some details are missing as they appear as pure colour.

Luminosity Histogram and RGB Histogram

There are a few options for channel; however, generally, luminosity is more accurate than RGB, for luminosity takes into account the fact that human eyes are more sensitive to green light than red light and blue light, describing the perceived brightness by a human observer. Thus the luminosity histogram is based on a weighted average of three colours of a pixel, retaining location information of pixels, while RGB histogram calculates the average value regardless of the fact that they might from different pixels.

The two histogram could vary a lot, if a picture contains a lot of pure green, red and blue colour, because the way RGB histogram calculate the value would have high distribution on the right hand side where the white point is.

They can be used differently, but for setting exposure, luminosity is obviously more appropriate.



Methodology

As this is a portrait, and thus the main focus is the girl, so the main goal here is to set the skin tone to zone six. Other kinds of photographs can be set accordingly.

One critical thing here is that only the part of skin directly expose to the light sources should follow the guideline.

Thus certain areas of the skin should be tracked down.

Image -> Adjustments -> Levels...

It opens a windows shows a histogram with three levers on the bottom. They are all for brightness adjustment. While the Option Key is hold, drag the white point lever to the left, till some area of her skin turns to white. Those are the areas needed.

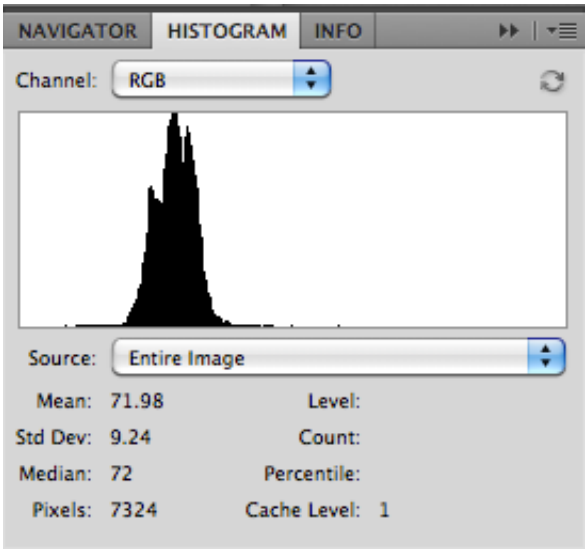
Nothing needs to be changed here, so simply close the window.

Those areas are going to be selected.

Press Q Key enter the Quick Mask Mode and use Brush (B Key) to paint those ares.

Press Q Key again to come back to normal mode. Select -> Inverse.

Voila, those areas are now selected.



Take a look at the histogram, it now shows only the information for the selected areas.

She does not seem to be pale, but for a outdoor scene, the skin tone should be in zone six or could be even in zone seven. Just try zone six first. According to those theories, those pixels should roughly distribute around the sixty percent's position of the horizontal axis.

Besides a histogram, the histogram panel can show additional statistical information related to it. In the histogram panel, from the upper right drop down menu, choose Show Statistics, and it will show the mean, average brightness value of all pixels, and median, the point where half the pixels are darker and half are lighter. Use either of them according to the shape of the distribution.

They won't make such big a difference in this case. Approximately, the Median is supposed to be 150, for the shape of the distribution is symmetrical. In other cases, use your own judgement.

Image -> Adjustments -> Exposure...

Move the Exposure Handle to the right till the Median reaches 150. Write down the value here, and simply quit by changing nothing, for we are going to apply the change to the whole image.

Select -> Deselect

Now it can, of course, be done by open the exposure adjustment window again, but it might lose the flexibility if we directly apply the change to the original image, so it could be better off having changes to a copy of it, or even better if the changes are applied to a layer mask.

Windows -> Adjustments

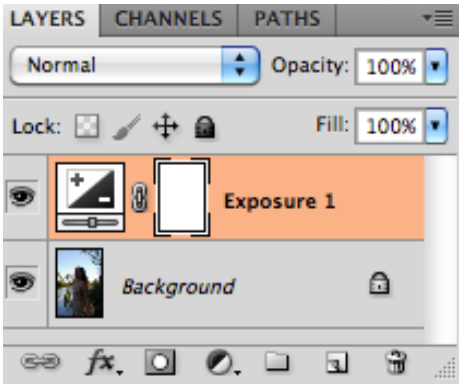
In the Adjustments Panel, choose Exposure, apply the value we wrote down before.

As it can be seen, the figure is well adjusted; however, the background got washed out.

There are so many ways to fix this problem. One way is to isolate the background and set the exposure for it as what is done to the figure. A quite way to fix it is to utilise our layer mask.

Window -> Layers

In the layers panel, select our adjustment layer.



Within a layer mask, white means mask, while black means nothing, and thus the underneath layer would be shown through the black areas. Grey means partially see-through. Since the background of the original image is good enough.

Press B Key to get to the brush tool, simply paint on the background with black colour or grey as needed.

Conclusion

With Zoom System in hand, fixing exposure should be a breeze; however, it is just a guideline and all depends on what you wish to convey. Sometimes you might a low key picture and sometimes you might want a high key one. Just don't let the Zoom System be burden to you.

References

http://www.youtube.com/watch?v=nBp7X83euLw&list=PL6C89A9A9B9CEE4F7&index=5&feature=plpp_video

http://www.cambridgeincolour.com/tutorials/histograms2.htm

http://en.wikipedia.org/wiki/Zone_System

PS A Better Way to Do So

I've just realised that there should be a better way to do it; however, it is largely similar.

Determine the highlights on the skin by Levels as before.

Directly apply the Exposure from the Adjustments panel.

With the adjustment layer selected, enter Quick Mask Mode, paint the highlights, quit and inverse the selections, so the histogram shows the information only for the selected areas.

Move the Exposure lever in the Adjustment panel till the highlights are in the desired position based on the theory described before. The difference here is that the change affects the whole image instead of the selected areas, so you can see the changes to other areas.

When the exposure is increased, the dark areas might be washed out. When an image contains many dark areas in the background, the Offset lever in the Adjustment panel can be very helpful. The Offset lever controls the brightness of the dark areas of an image, and it is designed to work with exposure, so it should be better than messing with Levels.