

**BIPC DIGITAL IMAGE STUDY GROUP  
ASSIGNMENT 2001-04**

**SUBJECT: CURVES**

ABSTRACT. We can use the curves tool to do the following [3].

- Pull out far more detail than it's possible to see with the sharpening filters.
- Lighten or darken areas without making selections.
- Color correct your images without guess work.

Learning how to use the curves tool is similar to learning how to ride a bicycle: we had lots of falls and skinned knees, but we were motivated and persevered. Once we learned we could ride our bikes without thinking. We can do the same with the curves tool.

These notes are based on the references listed below.

When we open the curves tool (Ctrl-m) we see a graph of a straight line resting on a grid. I prefer to click the little box that makes the curve larger, and then to alt-click in the center of the grid to increase the size of the grid from  $4 \times 4$  to  $10 \times 10$ . I also suggest that you use the "lock down curve" that is available in on the CD that comes with the book [2].

Last week we learned that in the levels dialog box there are two areas that have sliders: the input and the output. (In this dialog box left is dark, and right is light.) In the

curves dialog box these correspond to the horizontal and vertical axes respectively. (Consequently, in the curve dialog box we have up (right) is lighter and down (left) is darker.

Consider the input sliders in the levels dialog box. The slider on the left side corresponds to the lower left point on the curve. We move the slider to the right to set the “black point.” To accomplish the same thing in curves dialog box we move the lower left point to the right. How do we determine how much to move it? We use the eye dropper tool to find the value of the darkest spot, and then move the point to that value. Similarly, the upper right point on the curve corresponds to the right hand slider in the input area of the levels dialog box.

How do we perform the results that we obtain by moving the middle slider in the levels dialog box? We do this by moving the midpoint on the curve either up (sliding the middle slider to the right) or down (sliding the middle slider to the left).

**Exercise:** Place a point by clicking at the mid point of the line. What would happen if you move a point that is near the left side up? What would happen if we move it down? What about a point near the right side?

The slope of the curve (how steep it is) tells up about the contrast of the output. A steeper curve will have more contrast than a less steep curve. Thus to increase the contrast in an area<sup>1</sup> of our picture we need to make the section of the curve that corresponds to this area steeper. But how do we find the section of the curve that corresponds to the

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<sup>1</sup>In reality we are not working with an area of a picture. We are working with the pixels that have values similar to the area we are concerned with.

area in question? We click and move the mouse around the area. As we do this we notice that there is a small circle that moves along the curve. In the same way, to get less contrast we make the curve less steep.

**Exercise:** Take your favorite picture and experiment by varying the contrast in different areas.

**Exercise:** Read the section “Let’s Analyze a Classic Tip” in [3]. Then experiment with your favorite picture.

**Exercise:** What will happen if you move the lower left point to the upper left and move the upper right point to the lower right?

**Removing Color Casts.** This material comes from [1; p.p. 190–204]<sup>2</sup>. A color cast occurs when the Red, Green, and Blue channels of an image are not properly balanced. The cast can be across the entire range of pixel values or can be limited to the highlight, shadow or midtones of the image. Color casts are common in photographs. For example in New Mexico I frequently get a blue color cast because of the deep blue skies. We’ve all seen the red cast that we get when we take a picture under tungsten light using outside film.

You can get see this section of the book by going to <http://gimp-savvy.com/BOOK/index.html>, clicking on “list of figures” and then looking at Figures 6.13–6.16. You will actually find the text there.

The author uses a photo of a white-sandy path in the tropics as his example. He uses the eye dropper to measure

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<sup>2</sup>The Gimp is a clone of Photoshop that comes with the Linux operating system. Because it is a clone it lags behind, and for that reason I’ve moved from The Gimp to Photoshop. But his book has lots of nice ideas. You can read about the Gimp at <http://www.gimp.org>. You’ll also find a copy of the book there.

the dark, midtone, and highlight. He obtains the following readings.

	Red	Green	Blue
dark	33	35	52
midtone	111	132	179
highlight	173	172	206

It is easy to see that there is too much blue, and there might be a slight red deficiency in the midtone range. Using the Red curve the author marks, by clicking the three points (33, 33), (111, 111) and (173, 173). He then drags these three points to the points (33, 35), (111, 132), and (173, 172) respectively. Using the Blue curve he again marks and then moves the point (52, 52) down to (52, 35), the point (179, 179) down to (179, 132) and the point (206, 206) down to (206, 172).

You'll find his discussion of the picture of a tiger interesting. You can also check out the discussion in reference [2] on how to adjust the green color in his photo of the Grand Cañon.

#### REFERENCE

1. Cary Bunks, *Grokking the Gimp*, New Riders, Indianapolis.
2. Barry Haynes, and Crumpler, Wendy, *Photoshop 5 & 5.5 Artistry*, New Riders, Indianapolis.
3. Ben Willmore, *Understanding Curves*, Photoshop 6.0: Studio Techniques, pp. 185-208.