Constructed Color: Color Separations and Photoshop Layers

Professor Stephen Chalmers - Spring 2011 Intro to Digital Photo

Inspired by Professor Elaine O'Neil (Rochester Institute of Technology) and Professor Chuck Swedlund (formerly of Southern Illinois University)

Techniques to Explore

Can recording the various colors in a scene on different digital exposures be used to create a unique, full-color image? This assignment uses a digital camera and filters to investigate the basic principles behind color photography and imaging. While working on this assignment, you will explore: how your eyes see color; how filters work; how digital cameras work; the beginnings of color theory; and using Photoshop Layers to create a full-color image.

Overview of Assignment

- Find at least four interesting scenes (at least one or two in daylight) and make three photographs of each using each of the three separation filters I provided in class.
- Manipulate and combine the files using Photoshop to create four full-color images.

Part 1: Making the Exposures

Equipment needed:

- Digital Camera
- Tripod
- Three RGB filters: I'll provide you with squares of red, green and blue filters.

Find and expose several scenes using your camera. Shoot in daylight for at least one series of images…artificial light can be trickier. Use a tripod to ensure that your composition does not change from shot to shot. When you are sure of your composition, expose the scene through each of the filters separately. Each shot of a scene should be exactly the same composition since you will superimpose the files later. Take care not to accidentally kick the tripod between exposures, especially when changing the filter.

Part 2: Reassembling the Color Separations Using Photoshop

Converting the Red image to the Cyan layer

Each layer is converted to the color of the filter's complement. That is, the Red image becomes the Cyan layer, the Blue image becomes the Yellow layer, and the Green image becomes the Magenta layer.

1. Name each file with the name "red", "green", or "blue" in the filename in Bridge (i.e. "red_marketstreet", etc). Process each file in ACR – remove all saturation (color) and then increase contrast by using the 'Exposure' and 'Blacks' sliders.
2. Change your workflow options to be ProPhoto RGB, 16 bit color, 300ppi, and whatever the native resolution of your camera is (write this down, as you'll use it in a step below). Check the box that says "Open as Smart Object".
3. Open your images in Photoshop.
4. On your red image file, create a new layer by choosing the Layer/New Layer menu option. Name this layer CYAN in the dialog box.
5. Select the color for this layer. Open the Color Swatches Palette by selecting the Windows/Show Swatches menu option. If you let the cursor rest over a color square for a moment, a pop-up label will appear to identify the color's name. Find and click on "CMYK Cyan" (located in the upper left area). The foreground color in the Color Picker will change to this color.
6. Make sure that the new layer "CYAN" is active. Using either the fill command or the Paint Bucket tool (your choice) fill the layer with Cyan. The entire image area will be obscured with color.
7. On your layers palette, change the Blending Mode from 'Normal' to 'Screen' (using the pop-up menu at the palette's upper left). This option blends all tones in the original layer with a proportional amount of cyan, leaving white areas white. Play with the other blend modes (but make sure to change it back to "screen" when done).
8. You have now produced the equivalent of the cyan dye layer in a conventional color photo print or the cyan ink image on a printing press. Select both layers and convert the combined (not flattened) layers to a Smart Object and leave it open.

Converting the other images to their respective colors

Covert the other images to their respective color layers. Repeat the steps as above, but with the following modifications:

- » For the Green image, choose "CMYK Magenta" from the Color Swatches Palette. Name the new layer MAGENTA and fill with magenta. Convert the combined (not flattened) layers to a Smart Object and leave it open.
- » For the Blue image, choose "CMYK Yellow" from the Color Swatches Palette. Name the new layer YELLOW and fill with yellow. Convert the combined (not flattened) layers to a Smart Object and leave it open.

Combining the three separate images to form a full-color scene

Once you have prepared each layer, combine them in a new file to create a full-color image. Follow these steps:

9. Create a new file by selecting the File/New menu option. The New File dialog box will open. Give the file a name and set the size to slightly more pixels than the size of the native resolution of your file noted in Step #2 above.
10. Set the resolution to 300 ppi to match the working files, set the Mode to "RGB Color", the bit depth to "16" and set the Background to "White."
11. Shift-drag the three finished CMY Smart Objects into this new document.
12. Move the Blue/Yellow Smart Object to the top of the layers palette. Change the screen blending mode to "Multiply".
13. The second layer should be the Green/Magenta Smart Object. Change the screen mode to "Multiply" also.
14. The third layer down should be the Red/Cyan Smart Object. Keep the blend mode as “Normal” for this layer.
15. Your image should now be in color! In the Layers Palette, turn the individual layers on and off (by clicking on the "eyes") to see how the colors change.
16. Save your file as a PSD.

Improving Registration

17. It is possible (although hopefully unlikely if you used a tripod) that the three layers will not be in registration (that is, match up exactly). Turn of the top layer and select the Move tool. Select the middle layer and align it as well as possible with the bottom layer. It might help to zoom in or magnify to 100 percent. Repeat this process for the top layer.
18. You may also need to rotate a layer to achieve better registration. To do so, select the layer you wish to rotate and choose the Edit/Free Transform menu option. A bounding box appears around the image; you can rotate the layer around its center by positioning the cursor near one of the corner of the bounding box until the cursor changes to a curved double arrow, then clicking and holding the mouse to rotate the image. You can also use the Edit/Transform/Rotate menu option in the same fashion.

Final Stuff:

19. Fix the color to make it neutral/accurate, both with overall layer adjustments, and also (at least several) spot layer adjustments.
20. When you think the color is perfect (and you've run it by me too) place your finished file in the Dropbox using this naming convention: "cc-lastname-image0_.psd" (so for example, my first image would be:
    `cc-chalmers-image01.psd`
    Note: no late or misnamed files will be accepted.

Measure of Success:

This is a twenty-point assignment, based on the following criteria:

- » Assignment completed according to instructions listed for the assignment.
- » Attention to craft and development of technical ability.
- » Ability to understand and apply concepts presented in class.
- » Effort and motivation invested in project.
- » Willingness to explore and take risks (*especially concerning the subject matter of the images*).
- » Overall effectiveness, success and quality of project both visually and conceptually.