Color and Creativity

Color and Image Editing

There are many types of color-altering editing styles and techniques. We have...
  - removed color to create grayscale images.
  - combined color information to rebuild colors.

We will now explore how to selectively remove, alter, and invent colors...
Color Codes

**NOTE**: At times we’ll make use of six-character hexadecimal (base 16) color code as a “shortcut” for entering a color code. These still represent 0-255 in the same red, green, and blue channels, but it gives us a single thing to copy and paste when we need to.

Example Starter Photo

[http://www.cs.umd.edu/~egolub/HDCC208N/PoolToEdit.png](http://www.cs.umd.edu/~egolub/HDCC208N/PoolToEdit.png)
Selective Color via Masking

We could take a full-color photo and choose to make all but part of it grayscale.

Start by duplicating the layer and making that new layer grayscale.

Go to **Image**, then **Adjustments**, then **Black & White**. Chose an effect that you like for what will be the grays.

Selective Color: Why a Mask?

We now have a grayscale version in a layer.

Rather than erase from this layer, an action that can’t easily be changed later, we will instead add a mask to this layer.

Via this mask, we can choose what part of this layer appears, but can alter that choice easily.
Selective Color: Preparing the Mask

You can add a mask to that layer by going to **Layer**, then **Layer Mask**, then pick the **Reveal All** option.

A white rectangle will appear in the **Layers** pane next to the preview of the layer.

We can “cut” or “un-cut” the mask by painting regions black or white.

Selective Color: Making the Mask

A good starting point might be to use a smart selection tool to select the general area that you want to make color, and then “cut” that region of the mask (that area will turn black in the **Layers** preview’s mask).

It won’t be perfect, but it should be a good starting point…
Selective Color: Refining the Mask

Continue to refine the mask using the paint brush and/or eraser to alter the mask.

You’ll likely want to use a brush or eraser with a 100% hardness to get clean edges on your mask and change the size as you work.

In this context, “white” mean grays, “black” means colors.
Selective Color: Good and Bad Bases

What do you think made this photo a challenging base image on which to apply this particular effect?

• Shadows
• Reflections
• Lack of sharp edge transitions

Keep these (and more) in mind as you take a photo on which you plan to apply selective color.
Subtle can be Powerful

As you think about where and how you might use this effect, consider that subtle touches of color might be very powerful.

Imagine a person’s face where their lips and eyes are the only elements in color, or a scene of children playing where only something like their toy is in color.
Use the technique to convey a story?

Pleasantville (1998) was filmed in color and then parts were digitally selectively desaturated.

• The film makers had some sets, wardrobe, and even makeup “in black and white” to reduce the edit demands.
• They also altered some of the color elements.

Selective effects editing is not new…

Selectively adding or removing color, or selectively applying effects in general, dates back decades.

One example from the 1980s was the video for a-ha’s song “Take on Me” which made use of frame-by-frame rotoscoping to selectively convert video to comic book styled drawings.

https://www.youtube.com/watch?v=djV11Xbc914
Another type of color manipulation is color replacement. 
– Imagine wanting the maroon pool table to become green…

Color Replacement: One Technique

Open the photo, go to Image, Adjustments, and choose Replace Color...

Indicate the color to change (in this case perhaps hex #851C41), the “fuzziness” for matching that color (100 here), and the destination color (in this case perhaps #21851C). Do you see the “error” it made?
Color “Rotation”

Another manipulation is color or hue rotation.
– Imagine wanting the entire color palette to shift…

Open the photo, go to Layer, New Adjustment Layer, and choose Hue/Saturation...
• This time, we will shift the hue via this layer.
• The hue slider will go from -180 to +180 (degree of rotation of the spectrum).
• Try -60 and +120, for example.

To get a more complete sense of what this approach accomplishes, download and open the color image at http://www.cs.umd.edu/~egolub/HDCC208N/color.jpg, add the layer, then move the hue slider and watch…
Masking, Color Rotation, Fun!

By adding a hue/saturation adjustment layer, rotating the colors, and then using our earlier stencil technique and feathering to make a mask, we can get creative!

“Real” Colorization

If we have a photo that began as black and white, we could try to colorize it based on what we feel the different parts of it should look like.

We could also choose to desaturate a color photo and reinvent its color palette using the same techniques.
“Real” Colorization: Choosing a Color

Part of this process will be the selection of the colors that you want to apply to the image.

A common technique for color selection is to find a picture that has a desired color or palette of colors, and then sample from it to get the color code(s) you need using the color picker tool.

Paint and Blend

For each color that we plan to use, we will paint over the corresponding part(s) of the grayscale image, and then blend the color(s) into our base image.

• Create a new, blank layer.
• Double-click the color palette’s foreground color and enter your chosen color.
• Use the paint brush and paint over the part(s) of the image to which you want to apply the color.
• Go to the Layers pane and change the Mode to Overlay and touch up the paint layer as needed.
• Repeat…
Paint and Blend: Example

Let’s take an image from Flickr that says we are allowed to modify it, and turn it to grayscale then add some color back to it, “influencing” the lollipop with #D13E3E.

https://www.flickr.com/photos/pixculture/2814431418

Notice the texture comes through…
Colorization in History

The general “hand colorization” concept goes as far back as the origins of the photograph…

Artists would hand-color the monochrome prints using a variety of paints, dyes, pencils, etc.

Sometimes it was just to alter the tone, but other times it was in an attempt to recreate the nature of the true colors.

NASA (again)

Some of these approaches were used to colorize some grayscale film footage from NASA’s Apollo missions…
Fully or Semi-automated Colorization

Some algorithms work fully automatically to try to colorize a photo using computer vision, massive sample image sets, and machine learning. [https://demos.algorithmia.com/colorize-photos/](https://demos.algorithmia.com/colorize-photos/)

Let’s try it live with [https://www.flickr.com/photos/duald/6869964866/](https://www.flickr.com/photos/duald/6869964866/)

Some algorithms allow the user to be partially involved in the automated colorization process. [http://www.cs.huji.ac.il/~yweiss/Colorization/](http://www.cs.huji.ac.il/~yweiss/Colorization/)

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GIMP: Sample Colorize

In a grayscale image, we are basically just looking at light intensity (no hue). When we have a grayscale image, we are limited to 256 variants. We could add color to an image by assigning a 24-bit color to each luminosity level. This is essentially what GIMP’s “Sample Colorize” does.

- We provide an image whose primary colors we’d like to use on our image.
- Colors are assigned to each luminosity level based on the sample image.
- Our image is colorized based on these assignments.